



**CITY OF NEWARK  
DELAWARE**

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Bid Security

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Vendor

CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

NOTICE

Return intact with properly  
completed forms or bid may be rejected.

CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

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CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REPLACEMENT – 2018

NOTICE OF LETTING

Sealed bids for Contract No. 18-07, “CMP STORM SEWER REHABILITATION - 2018”, will be received in the Purchasing Office, Newark Municipal Building, 220 South Main Street, Newark, Delaware 19711 until 2:00 p.m., prevailing time, October 16, 2018 and will be publicly opened and read aloud in the Council Chamber shortly thereafter.

A non-mandatory pre-bid meeting will be held on October 2, 2018, at 10:00 a.m. at the Newark Municipal Building. Site visits are allowable and must be scheduled at least 10 days in advance of bid submission. For information, call (302) 366-7000.

Plans and Specifications may be obtained from the City’s web page [www.cityofnewarkde.us/bids.apsx](http://www.cityofnewarkde.us/bids.apsx). Information can be found by accessing the Bid/Proposal Opportunities link on the home page.

CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

GENERAL PROVISIONS

**1. BIDS**

Each bid shall be submitted on the proposal form included herein. The proposal and all other required documents must be submitted in a sealed envelope clearly identified with the bidder's name and marked "City of Newark - Contract No. 18-07, "CMP STORM SEWER REPLACEMENT – 2018." Bid Documents must be received in the Purchasing Office prior to 2:00 p.m. prevailing time, October 16, 2018. Each bid so submitted shall constitute an irrevocable offer for a period of sixty (60) calendar days following the bid opening date.

A non-mandatory pre-bid meeting will be held on October 2, 2018, at 10:00 a.m. at the Newark Municipal Building. Site visits are allowable and must be scheduled at least 10 days in advance of bid submission.

**2. DEFINITIONS**

- A. *Agreement:* The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
- B. *Contract Documents:* Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
- C. *Contractor:* The individual or entity with whom the Owner has entered into the Agreement.
- D. *Owner:* The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed. The Owner for this project is the City of Newark.
- E. *Shop Drawings:* All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
- F. *Site:* Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.



- G. *Subcontractor* – An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
- H. *Work*: The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, as required by the Contract Documents.

### **3. BID SECURITY**

Each bid must be accompanied by a certified check, cashier's check, or bid bond in the amount of five percent (5%) of the proposed bid price, payable to the City of Newark. Failure to provide the required bid security may be grounds for rejection of the bid. If the successful bidder fails or refuses to execute and deliver the contract within fourteen (14) calendar days after receiving notice of the award of the contract, the successful bidder shall forfeit to the City for such failure or refusal the security deposited with the bid. Any certified check or cashier's check submitted as security shall be returned to all unsuccessful bidders sixty (60) calendar days after the bid opening date. The successful bidder shall provide the City with a Contract Surety Bond in the full amount of the contract guaranteeing faithful performance of the contract. Such bond shall be provided to the City with the executed contract within fourteen (14) calendar days after receiving notice of award of the contract. Upon receipt of the contract surety bond, the City will return any certified check or cashier's check submitted as bid security by the successful bidder.

### **4. TAXES**

The price(s) quoted shall not include federal or state taxes. If applicable, the successful bidder shall provide the City with three (3) copies of the required tax exemption forms to accompany the bidder's invoice.

### **5. AWARDS**

The City Manager will review each of the bids submitted and make a recommendation to the City Council on the disposition of the bids. The City Council reserves the right to accept or reject any or all bids or parts of bids as they may determine and to waive any irregularities or defects where the best interest of the City would be served.

### **6. BID PRICE**

The bid price shall include all transportation, delivery, installation and all charges for the goods and services specified to complete the work identified for each individual bid item. The work done under this contract will be funded by the City of Newark. The State of Delaware prevailing wage schedule will therefore not be applicable to this contract.

## **7. COMPLETION DATE AND TIMES**

The Contract will have a start date of November 19, 2018. The project completion date is March 19, 2019. Liquidated damages of five hundred dollars (\$500.00) per day may be assessed to the Contractor by the City for each day the contract is extended beyond the completion date. Liquidated damages are not to be construed as a penalty in any sense.

## **8. INTENT OF SPECIFICATIONS**

It shall be the contractor's responsibility to furnish the goods and services specifically indicated in the scope of work and specifications and such other as may be required to meet the intent of the specifications, drawings, or as may be necessary to provide the operation intended by the City.

## **9. EXCEPTIONS/DESCRIPTIVE INFORMATION**

Any and all exceptions which are taken to the specifications must be noted in the space provided on the proposal. Any exception to the specifications may be grounds for rejection of the bid.

## **10. EQUALS**

Where a product is specified by catalog or model number, the acceptability of any other "or approved equal" product shall be subject to the sole judgment of the City of Newark.

## **11. WARRANTIES AND STANDARDS**

All goods are to be new and unused in all component parts, including all accessories. The specifications will be construed as the minimum required. When the manufacturer's standard exceeds the specifications, the standard units will be furnished. All materials shall be free of defects. All standard manufacturer's warranties and guarantees shall apply to equipment and goods supplied under this contract.

All goods and materials shall be produced or manufactured in the United States, unless otherwise approved in writing. Appropriate documentation shall be provided with all goods and material submittals.

## **12. WORKMANSHIP**

Workmanship will conform to the best current manufacturing practice followed for goods of this type. Component parts and units will be manufactured to definite standard dimensions with proper fit and clearances.

### **13. FINAL INSPECTION**

All delivered goods and services will be subject to inspection by the City of Newark, Delaware. If in any way an item fails to meet the terms of the contract, it may be rejected or liquidated damage charges made. The decision of the City will be final and any rejected items or materials will have to be replaced at the expense of the vendor.

### **14. ADVERTISEMENTS**

Any bidder submitting a bid will not use the name of the City in any advertisement without first obtaining the written consent of the City Manager.

### **15. EEO AND BUSINESS LICENSES**

The bidder shall possess all required business or other licenses and also shall be a fair and equal opportunity employer.

### **16. NON-COLLUSION**

The bidder shall not, either directly or indirectly, enter into any agreement, participate in any collusion, or otherwise take any action in restraint of free competitive bidding in connection with the contract.

### **17. ADDENDA AND QUESTIONS**

Any changes to the contract documents shall be made by written addenda, issued no later than four (4) calendar days prior to the bid opening date. Bidders shall bear the entire responsibility for being sure they have received all such addenda.

Any questions regarding the bidding process should be directed to Ms. Cathy Trykowski, Purchasing Administrator, at [ctrykowski@newark.de.us](mailto:ctrykowski@newark.de.us) or (302) 366-7000. Any questions regarding the technical specifications should be directed to Mr. Timothy Filasky, PE, Acting Director, Water Resources and Public Works, at [tfilasky@newark.de.us](mailto:tfilasky@newark.de.us) or (302) 366-7000.

### **18. PAYMENT**

No invoice will be processed for payment until the goods and/or services have been delivered and verification is made that the specifications under this contract have been met. Progress payments, when requested, will be evaluated and approved for payment based on work completed to date according to the approved schedule of values. Payment for material stored on-site will be made at 50% of the material's invoice price. Full payment will be made after the material is installed. Payment will be made within thirty (30) days of final acceptance by the City.

## 19. BIDDERS QUALIFICATIONS

No contract will be awarded to any bidder who in the judgment of the City is not a responsible bidder, or is not prepared with all the necessary experience, capital, organization and equipment to conduct and complete the work for which the bidder proposes to contract.

EACH BIDDER SHALL SUBMIT WITH THE BID A LIST OF AT LEAST FIVE REFERENCES FOR COMPLETED PROJECTS WHICH MUST INCLUDE CONTACT PERSON, AGENCY AND PHONE NUMBER.

## 20. LIABILITY INSURANCE

- A. Except as otherwise provided by law, the contractor shall at all times maintain and keep in force such insurance as will protect him from claims under Worker's Compensation Acts, and also such insurance as will protect him and the owner from any such claims for damages for personal injuries, including death, which may arise from operations under this contract, whether such operations be by the contractor or by any subcontractor or anyone directly or indirectly employed by any of them.
- B. To be eligible to bid the project, the Prime Contractor shall be required to provide a letter stating an insurer is prepared to provide coverage. Formal proof of coverage will be required prior to signing the contract.
- C. The Prime Contractor shall be required to provide Commercial General Liability (CGL) coverage with limits of insurance not less than:

- \$2,000,000 Each Occurrence Limit
- \$2,000,000 Personal & Advertising Injury Limit
- \$3,000,000 Annual Aggregate Limit
- \$3,000,000 Products-Completed Operations Limit
- \$1,000,000 Business Auto Liability Limit
- \$5,000,000 Commercial Umbrella Limit

The Prime/General Contractor, The City of Newark (Owner), and all other parties required of the general contractor shall be included as insured on the CGL, using Additional Insured Endorsements providing coverage as broad as the coverage provided for the named insured subcontractor.

Subcontractors approved in association with the hiring of a Prime Contractor shall be required to provide Commercial General Liability (CGL) coverage with limits of insurance not less than:

- \$1,000,000 Each Occurrence Limit
- \$1,000,000 Personal & Advertising Injury Limit

\$2,000,000 Annual Aggregate Limit  
\$2,000,000 Products-Completed Operations Limit  
\$1,000,000 Business Auto Liability Limit  
\$3,000,000 Commercial Umbrella Limit

D. All Contractors shall provide Contractors Pollution Liability with limits not less than:

Each Claim or Occurrence	\$3,000,000
Annual Aggregate	\$3,000,000

The Contractors Pollution Liability policy shall include coverage for Emergency Response Costs, Contingent Transportation, Non-Owned Disposal Sites, and Natural Resource Damage. If coverage is written on a claims-made basis, an Extended Reporting Period, or tail coverage, shall be provided for thirty (30) days following completion of the insured's services. In the alternative, the Contractors Pollution Liability policy shall be renewed for not less than thirty (30) days following completion. The policy retroactive date shall be no later than the effective date of this Agreement.

**21. ITEMS TO BE EXECUTED AND SUBMITTED WITH BID**

Bidders are notified that the proposal, non-collusion statement, insurance documentation, bid security, **and all other submittals as outlined in the technical specifications** must be executed and completed in full and submitted with the bid at the time of bidding, or bid may be subject to rejection.

**22. ITEMS TO BE SUBMITTED WITH SIGNED CONTRACT**

- A. Schedule of Values
- B. Construction Schedule
- C. Construction Bond
- D. Insurance Documentation

**23. RETAINAGE**

The City will retain 5% of the progress payments until such time as the project is complete and accepted by the City.

**24. GUARANTEE**

The contractor shall guarantee the work, materials, and equipment and the other Contract performances, and shall remedy, without cost to the Owner, any defects that may develop therein during a period of one year from the date of the Owner's acceptance of the Certificate of Substantial Completion.

## **25. INDEMNIFICATION**

The contractor shall solely be responsible and liable for the accuracy and completeness of all work performed and shall agree to indemnify, defend and hold harmless the City of Newark, its officers, agents and employees, from and against any and all claims, actions, suits and proceedings arising out of, based upon or caused by negligent acts, omissions or errors of or the infringement of any copyright of patent, by the contractor, its officers, agents, employees or subcontractors, in the performance of the contracted agreement.

## **26. TERMINATION OF AGREEMENT**

This agreement may be terminated by the City upon thirty (30) days written notice if the contractor fails to perform satisfactorily in accordance with the terms and conditions of the contract. In the event this agreement is terminated, the contractor shall be paid for services satisfactorily rendered up to the termination date.

## **27. FAMILIARITY WITH PROPOSED WORK**

A complete understanding of the conditions as they exist is required by careful personal examination of the work at the site. Each contractor bidding must completely satisfy himself as to the exact nature and existing conditions of the work area and treatment facility. The contractor also shall examine carefully the plans, if any, specifications and the contract forms for the work contemplated. Failure to do so will not relieve the successful contractor of his obligation to carry out the provisions of the contract.

The contractor shall not, at any time after the execution of the contract, set up any claims whatever based upon insufficient data or incorrectly assumed conditions, nor shall claim any misunderstanding in regard to the nature, conditions or character of the work to be done under this contract, and shall assume all risks resulting from any change in the conditions which may occur during the progress of the work.

## **28. CONTRACTOR'S UNDERSTANDING**

It is understood and agreed that the contractor has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground; the character, quality and quantity of the material which will be required; the character of equipment needed preliminary to and during the prosecution of the work; the general and local conditions; all permit restrictions and conditions; and all other matters which can in any way affect the work under this contract. No verbal agreement or conversation with any officer, agent or employee of the City of Newark, either before or after the execution of this contract, shall affect or modify any of the terms or obligations herein contained.

## **29. SAFETY REQUIREMENTS**

The Contractor shall comply with the requirements and standards of the Occupational Safety and Health Act and all other state and local laws, ordinances and codes governing all work to be provided under the contract documents.

The Contractor shall maintain on-site and in all vehicles at all times spill response equipment appropriate for the types and quantities of fluids and/or materials that may be subject to spillage during the project. All discharges to the storm drainage system or surface waters are strictly prohibited. In the event that a spill reaches the storm drainage system and/or surface waters, the contractor shall notify the Public Works and Water Resources Department immediately at 302-366-7000. The Contractor will also be responsible for spill response and clean-up at no cost to the owner. If the Contractor fails to respond to and clean up a spill to the satisfaction of the owner, the owner will perform clean up and bill the Contractor for 150% of the personnel time and material expenses incurred by the City as necessary for the response.

## **30. RESTORATION OF DISTURBED AREAS AND CLEAN UP**

Upon completion of the work, all related work, such as lawns, curbs, sidewalks, fences, shrubbery, and driveways that have been disturbed shall be restored to their original condition and in accordance with City of Newark Standards and Specifications. The area shall be cleared of all tools, equipment and refuse resulting from the project. The contractor shall, at the end of each day, leave the areas in which he has worked, free of debris and safely secure his material and equipment.

## **31. INSPECTION OF MATERIAL AND WORK**

- A. Workmanship shall be of good quality and all work and material shall be at all times subject to the inspection of the City of Newark or their duly authorized representatives. The contractor shall provide reasonable and necessary facilities for such inspection. If required by the City of Newark, the contractor shall take down or uncover portions of the finished work.
- B. The contractor agrees that in case any of the material or work, or both, shall be rejected as defective or unsuitable by the city, material and the work shall be done again immediately to the satisfaction and approval of the city at the cost and expense of the contractor.
- C. Any omission or failure on the part of the City of Newark or inspectors to disapprove or reject any defective work or materials shall not be construed to be an acceptance of any defective work or material.
- D. In case the City should not consider the defect of sufficient importance to require the contractor to replace any imperfect work or materials, the city shall have the power to make an equitable deduction from the stipulated price.

- E. Neither the inspection nor supervision of the work, nor the presence or absence of an inspector shall relieve the contractor of any of his obligations under the contract or of making his work conform to the specifications.

### **32. DEBRIS COLLECTION AND DISPOSAL**

The Contractor is responsible for collection, removal, transport and lawful disposal of construction debris and or materials.

### **33. OWNERSHIP OF MATERIAL**

All documents prepared and submitted pursuant to this RFP or contract shall be property of the City upon submittal and will be subject to staff and public review and discussion in association with our public bidding and formal proposal process. Any information or documents deemed proprietary shall be so marked at time of submittal and limited to detail where the disclosure of contents could be prejudicial to competing offerors during the process of negotiation, and any commercial or financial information of a privileged or confidential nature.

### **34. FORCE ACCOUNT WORK**

All extra work done on the force account basis, the use of which has been authorized by the Engineer, will be paid for in the following manner:

- A. Labor. For all labor and foremen in direct charge of the specific project, the Contractor shall receive as shown on his weekly payroll the basic hourly wage, overtime and fringe benefits not paid in cash to the employee for each and every hour that said labor and foremen are actually engaged in such work, to which cost shall be added an amount equal to 26 percent of the sum thereof. The Superintendent's time will not be allowed.
- B. Materials. For materials accepted by the Engineer and used, the Contractor shall receive the actual cost of such materials delivered on the work, including transportation charges paid by him to which the cost of 15 percent will be added.
- C. Equipment. For any machinery or special equipment including fuel and lubricants, plus transportation costs, the use of which has been authorized by the Engineer, the Contractor shall receive the rental rate agreed upon in writing before such work is begun for the actual time that such equipment is in operation on the work, to which rental sum 15 percent will be added. In addition to the above, the actual transportation costs for one move in and one move out may be allowed. When the County is obligated to pay for idle equipment the allowance shall be seventy-five percent of the agreed on equipment rental rate. To compute hourly rates use eight hours per day, forty hours per week and one-hundred and seventy-six hours per month.



- D. Miscellaneous. No additional allowance shall be made for the general superintendence of the project, the use of small tools, or other costs for which no specific allowance is herein provided.
- E. Compensation. The compensation as set forth above shall be received by the Contractor as payment in full for extra work done on a force account basis. At the end of each day the Contractor's representative and the Inspector shall prepare and sign records of the cost of work as ordered on a force account basis.
- F. Statements. No payment will be made for work performed on a force account basis until the Contractor furnishes the Engineer duplicate itemized statements of the cost of such force account work.

### **35. REGULATIONS AND EXCEPTIONS**

Any and all exceptions which are taken to the specifications shall be noted on the Proposal form. The listing of an exception may be grounds for rejection. All equipment must meet all applicable federal or state regulations.

The application of lead paint as defined in Title 16, Chapter 30M of State Code and Chapter 7 of City Code as part of this contract is prohibited. The contractor will be subject to fines as outlined in State and City Code if it is determined that lead paint was applied in violation of State and City code. Safety Data Sheet information for all paints applied to internal or external structures shall be provided to the City for review and approval prior to application.

The contractor will be required to remove and remediate any lead paint to the satisfaction of the City, at no cost to the City. Prior to commencing removal and remediation efforts, the contractor shall provide a written remedial action plan which includes health safety protection requirements for both employees and the public for review and approval by the City and/or DNREC/DHSS. Any and all sample results that are generated as a result of improper application of lead paint shall be provided to the City within 5 working days of being received by the contractor. The contractor will also be required to replace all paint removed with non-lead paint to the satisfaction of the City, and at no cost to the City.

Failure to adequately remove, remediate, and replace lead paint applied in violation of State and City Code as outlined herein will be considered a breach of contract.

CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REPLACEMENT – 2018

SCOPE OF WORK

**1. DESCRIPTION**

The CMP STORM SEWER REHABILITATION - 2018 project consists of the removal of existing Corrugated Metal Pipe (CMP) and installation of new Reinforced Concrete Pipe (RCP) or High Density Polyethylene Pipe (HDPE) of equivalent size, located within the corporate limits of the City of Newark, Delaware. This project includes, but not limited to, the following major work items, provided in the construction plan drawings:

- A. Removal and disposal of existing single and double drainage inlets, manholes, and CMP.
- B. Installation of precast single and double drainage inlets, and manholes. Details shown on plans and profiles.
- C. Installation of RCP, gaskets, and any additional materials to adequately seal connections to inlets and manholes under unpaved areas, paved areas, and sidewalks.
- D. Installation of HDPE, fittings, and any additional materials to adequately seal connections to inlets and manholes under unpaved areas, paved areas, and sidewalks.
- E. Remove, store, and re-set mailboxes and traffic signs.
- F. Restoration of existing pavement, concrete, driveway aprons, curb ramps, concrete curbs, sidewalk, and grass.
- G. Maintenance of traffic in accordance with the latest Delaware MUTCD manual.
- H. The attached construction plans and details further define the scope of work. The Contractor shall furnish all required labor, materials, equipment and appurtenances necessary to complete the work.

## **2. LOCATION**

The project consists of the following general areas as shown on the drawings and described herein:

- Area 1: Along New London Road and Scotch Pine Road
- Area 2: Creek Bend Drive, near the intersection of Creek Bend Court
- Area 3: Ranch Court Cul-de-Sac

## **3. PERMITS, CERTIFICATIONS, LAWS AND ORDINANCES**

The Contractor is required to have or obtain a City Contractors License prior to starting the work. The Contractor is required to obtain any building permits required for completion of the work. The fees for City of Newark permits will be waived.

The Contractor shall perform the work in accordance with all local, state and federal laws and ordinances.

## **4. COORDINATION**

- A. Contractor shall coordinate construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Contractor shall coordinate its operations with operations that depend on each other for proper installation, connection, and operation.
- B. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
- C. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
- D. Make adequate provisions to accommodate items scheduled for later installation.
- E. Contractor is required to notify in writing via door hangers all properties located adjacent to or directly affected by the Contractors work.

## **5. SUBMITTALS**

The Contractor should provide submittals for review and approval in PDF format. For scheduling purposes, the Contractor shall allow for fourteen (14) day review time by the City. The Contractor shall provide the following submittals to the Owner for review and approval:

- A. Construction Schedule
- B. Contractor shall submit a sketch of the project area showing the required staging and storage area to the Owner for review.

- C. Shop drawings for all proposed materials and equipment as outlined in the technical specifications.
- D. Door hanger used for resident notifications.

## **6. RESTORATION**

The Contractor is responsible to restore all disturbed areas to original or better condition and remove all debris, residuals, trash, and excess materials from the sites.

## **7. SECURITY AND SITE ACCESS**

The Contractor is responsible for security of his equipment and materials related to the work.

The Contractor is responsible to maintain the work sites in a safe and orderly manner.

Contractor shall have full use of Project site for construction operations during the construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

Limit use of Project sites to work in areas indicated. Do not disturb portions of Project sites beyond areas in which the Work is indicated.

- A. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
- B. Schedule deliveries to minimize use of driveways and entrances by construction operations.
- C. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

## **8. WORK RESTRICTIONS**

- A. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. Any and all work within a DeDOT right-of-way shall be in accordance with DeDOT work restrictions and traffic control requirements which may require night time work activity inside the right-of-way when impacting the travel lanes.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than five days in advance of proposed utility interruptions.
  2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Owner not less than two days in advance of proposed disruptive operations.
  2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products and other controlled substances on Project sites is not permitted.
- F. Contractor shall have contaminant spill response equipment readily available on-site during construction activity.

## 9. WORKING HOURS

- A. Normal working hours are 7:00 am to 4:00 pm Monday through Friday. Allowable working hours are from 7:00 am to 9:00 pm Monday through Saturday. Sunday work may be completed from 9:00 am to 9:00 pm when written authorization has been granted from the Owner. The Contractor is not permitted to work on City recognized holidays.
- B. In the event that the contractor works outside of the above stated normal working hours, the contractor shall be required to pay for inspection or engineering services performed during these times. Payments for these additional services shall be made by a reduction in the amount paid to the Contractor based upon the hourly rates defined in the table below.

Labor Classification	Hourly Rate
Inspecting Services	\$90.00
Engineering Services	\$125.00

Contractor shall notify the Owner forty eight (48) hours in advance of their intent of working outside of normal working hours.

## **10. SITE CONSTRUCTION AND EXISTING UTILITIES**

- A. The Contractor is responsible to account for and consider existing site conditions and existing utilities. Prior to starting any work, the Contractor shall contact Miss Utility of Delmarva at 1-800-282-8555 for a utility mark out. The Contractor is responsible for locating and protecting existing utilities for the duration of the work.
- B. The failure to show on the contract drawings any existing utilities shall not relieve the contractor of his responsibility in determining the locations of utilities.
- C. Any damage done to existing utility lines, services, poles and structures shall be repaired or replaced by the Contractor at his own expense. The Contractor shall notify the City and the owner of any damaged utility within 24 hours. The Contractor shall notify all possible owners of utilities in the areas where work is to be done and the schedule and extent of such work.

## **11. STARTING DATE AND SEQUENCE OF CONSTRUCTION**

The starting date of this contract will be specified by the City in a written "Notice to Proceed." A preconstruction meeting shall be scheduled to finalize the sequence of construction. The final decision as to the sequence of construction shall be that of the Owner.

## **12. COORDINATION WITH THE CITY**

The Contractor shall coordinate all activities with the City. The Contractor shall provide the City with reasonable time to respond to requests for information and for coordination.

## **13. TECHNICAL SPECIFICATIONS**

Technical specifications as attached are included in the contract.

## **14. CONTRACT DRAWINGS**

Project drawings prepared by the City of Newark as provided are considered contract documents. See the cover sheet of the plan set for the list of drawings.

## **15. PROTECTION TO PUBLIC AND PROPERTY**

- A. The contractor shall insure protective measures to the general public and to occupants of property along and adjacent to the work area.
- B. The contractor is responsible for any and all damage or injury of any kind which

directly or indirectly may be done to any property or sustained by any persons during the execution of the work.

- C. If any direct or indirect damage or injury is done to public or private property by, or on account of, any act, omission, neglect or misconduct in the execution of the work, the contractor shall restore at his own expense such property to a condition similar or equal to that existing before such damage or injury was done. This may be achieved by repairing, rebuilding or otherwise restoring as directed. The contractor shall make good such damage or injury in an acceptable manner to the City and property owner.
- D. The Contractor shall retain the services of a Structural Professional Engineer licensed in the State of Delaware capable of providing residential foundation assessment and any required design work for the replacement of the CMP at Area 3. The Engineer shall inspect the foundation of the two private residences adjacent to the pipe being replaced prior to the mobilization of heavy equipment and delivery of materials on site. The Engineer shall photo-document the existing conditions of the foundations and provide an inspection report to the City, prior to commencement of work. The Engineer shall re-inspect the foundations upon completion of the work at Area 3 and provide a final assessment report with photo documentation to ensure no damages were incurred during construction. The Contractor shall rebuild, repair, restore, and make good all losses, injuries, or damage to any portion of the Work under the control of the Contractor and/or due to his/her fault or inactivity, at no cost to the City. Items not under the control of the Contractor shall be defined for purposes of this Section as Acts of God such as earthquakes, tornadoes, or hurricanes, etc. Payment for the structural engineering assessment shall be incidental to the unit price for 48-inch HDPE pipe installation.

## **16. SAFETY PRECAUTIONS**

- A. The Contractor shall execute work under this contract with the utmost concern for the safety of the general public. All areas worked upon and subject to travel by the public shall be identified with the proper warning indicators and signs during the working period. Upon completion of the contract or when such areas are reopened to public travel, they shall be rendered in a safe condition using either temporary or permanent repair material as the case may be. No private driveway shall be blocked or closed without the property owner being notified prior to construction.
- B. Streets, roads and driveways used by the contractor for access to and from the work site shall be protected from damage in excess of that caused by the normal traffic of vehicles used for or in connection with construction work. Any such damage done shall be repaired immediately and left in good condition at the end of the

construction period and shall be repaired at the contractor's expense.

**17. RIGHT-OF-WAY**

All operations shall be confined to the assigned work area. The City will provide no right-of-way over other properties. The contractor shall take every precaution to minimize the inconvenience to the owners or tenants of adjacent property. Public roads shall not be obstructed in such a way as to cut off traffic. The contractor shall, at his own expense, repair any damage or injury to either public or private property during the progress of the work.

**18. TRAFFIC CONTROL AND ROAD SIGNS**

- A. The contractor shall be responsible for traffic control for the duration of the project and shall coordinate traffic control plans and obtain necessary approval from DelDOT for work on or near state-owned roads. The contractor shall be responsible for removal and re-installation of all signs in the work area. Signs necessary for the safe movement of traffic shall be maintained in operation during construction. Any other signs shall be properly stored by the Contractor, who shall be responsible for them. All signage shall comply with the current Manual on Uniform Traffic Control Devices (MUTCD).
- B. The Contractor shall provide one (1) week notice to the City for any planned road or entrance closure.

**19. EXCAVATED MATERIAL**

It shall be the responsibility of the contractor to dispose of all excavated material which, in the opinion of the City, is unsatisfactory for backfill or fill. The cost of this disposal shall be borne by the contractor.

**20. DUST CONTROL/EROSION AND SEDIMENT CONTROL**

It shall be the responsibility of the contractor to handle dust control on this project and necessary erosion and sediment controls required by the City and State, including, but not limited to, storm sewer inlet protection. The City Inspector shall make the final determination on necessary measures.

**21. WATER SUPPLY**

The contractor shall not use City fire hydrants without permission. The contractor shall provide their own water for use during construction. If requested, the contractor may obtain water from the City's maintenance yard.



## **22. JOB SITE MAINTENANCE, RESTORATION AND CLEANUP**

The contractor is responsible to restore all disturbed areas to original or better condition and remove all debris, residuals, trash, and excess materials from the site. The contractor is required to keep the work area clean during construction and remove trash as it accumulates. Roads shall be kept clean and free of mud, debris and dirt. At the direction of the City Inspector, the contractor is responsible for the cost of street sweeping and maintenance required for upkeep of clean road surfaces.

## **23. DRAWINGS**

Project Drawings are included as Attachment 1. Equipment and materials specifications are contained in these specifications.

## **24. PROGRESS MEETINGS**

The City or Contractor may request progress meetings during the contract term. The Contractor's and City's designated Project Manager shall attend any progress meeting.

## **25. BID ITEMS**

Bidders must provide prices on the Proposal form including all adjustment bid items.

## **26. BASIS OF PAYMENT**

The quantity of pipe lining will be measured in linear feet along the bottom centerline as installed and accepted. All other items, methods, and materials necessary to complete the work described in each pay item shall be incidental to the bid item the work is being completed under.

The Owner reserves the right to delete from the Contract one or more items listed and the right to add or subtract from the quantity of each item. The total price to be paid will be adjusted in accordance with the Contractor's unit prices as required above. There will be no extra compensation or increase in unit prices in the Proposal if such additions and/or deletions are made to quantities.

CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

PROPOSAL

To: The Mayor and City Council  
Newark, Delaware

From: \_\_\_\_\_

The undersigned as a lawfully authorized agent for the below named bidder has carefully examined the Bid Documents to be known as Contract No. 18-07 and bids himself on award to him by the Mayor and City Council of Newark, Delaware to execute in accordance with such award, a contract of which this Proposal and said General Provisions and Specifications and any Addenda shall be a part, and to furnish the goods as specified F.O.B. Newark, Delaware in a manner that is in complete accordance with said General Provisions and Specifications at the following named unit price on or before the delivery period stated below:

Area 1:

<u>Bid Item</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost (\$)</u>	<u>Total Amount (\$)</u>
1	Remove 15" CMP and Install 15" RCP	208	LF		\$
2	Remove and Install Integral Curb and Gutter	88	LF		\$
3	Remove and Install Depressed Curb	40	LF		\$
4	Remove and Replace Residential Area Sidewalk (4")	312	SF		\$
5	Remove and Replace Residential Area Sidewalk (6")	228	SF		\$
6	Replace Existing Single Catch Basin Curb Inlet	1	EA		\$
7	Replace Existing Double Catch Basin Curb Inlet	1	EA		\$

Total Area 1: \$ \_\_\_\_\_

Area 2:

<u>Bid Item</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost (\$)</u>	<u>Total Amount (\$)</u>
1	Remove 15" CMP and Install 15" RCP	28	LF		\$
2	Remove 20" CMP and install 21" RCP	33	LF		\$
3	Remove and Install Integral Curb and Gutter	44	LF		\$

Total Area 2: \$ \_\_\_\_\_

Area 3:

<u>Bid Item</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost (\$)</u>	<u>Total Amount (\$)</u>
1	Remove 48" CMP and Install 48" HDPE	121	LF		\$
2	Install 48" Flared End Section	1	EA		\$
3	Remove and Install Rolled Curb & Gutter	12	LF		\$
4	Replace Existing Double Catch Basin	1	EA		\$
5	Install Riprap	37	SY		\$

Total Area 3: \$ \_\_\_\_\_

Project to be completed by \_\_\_\_\_

DATE: \_\_\_\_\_ BIDDER: \_\_\_\_\_

By: \_\_\_\_\_  
Its legally authorized representative

PRINT NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

BOND TO ACCOMPANY PROPOSAL

(not necessary if certified or cashier's check is used)

KNOW ALL MEN BY THESE PRESENTS THAT \_\_\_\_\_  
of \_\_\_\_\_ of the County of \_\_\_\_\_  
and State of \_\_\_\_\_, principal, and \_\_\_\_\_  
of \_\_\_\_\_ as surety, legally authorized to do business in the  
State of Delaware, are held and firmly bound unto the City of Newark in the sum of  
\_\_\_\_\_  
\_\_\_\_\_ dollars, to be paid to said City of Newark for use  
and benefit of the Mayor and Council of Newark, for which payment well and truly to be made, we  
do bind ourselves, our and each of our heirs, executors, administrators and successors, jointly and  
severally, for and in the whole, Contractor by these presents. Sealed with our seal dated the \_\_\_\_  
day of \_\_\_\_\_ in the year of our Lord, two thousand  
\_\_\_\_\_ (20\_\_).

NOW THE CONDITIONS OF THIS OBLIGATIONS IS SUCH, that if the above bounded principal who has  
submitted to said City of Newark, a certain proposal to enter into a certain Contract No. 18-07, CMP  
STORM SEWER REHABILITATION - 2018 and if said \_\_\_\_\_  
shall well and truly enter into and executes said contract and furnish therewith such Surety Bond or  
Bonds as may be required by the terms of said contract and approved by said City of Newark, said  
Contract, and said Bond to be entered into within fourteen (14) calendar days after the date of

official notice of award thereof in accordance with the terms of said proposal, then this obligation to be void, otherwise shall remain in full force and virtue.

SIGNED AND SEALED IN THE PRESENCE OF WITNESS:

SIGNED \_\_\_\_\_ (SEAL)

BY \_\_\_\_\_ (SEAL)

\_\_\_\_\_  
SIGNED \_\_\_\_\_ (SEAL)

BY \_\_\_\_\_ (SEAL)

CITY OF NEWARK

Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

NON-COLLUSION STATEMENT

Date: \_\_\_\_\_

City of Newark  
Newark, Delaware

Gentlemen:

This is to certify that the undersigned bidder \_\_\_\_\_  
has not, either directly or indirectly entered into any agreement, participated in any collusion, or  
otherwise taken any action in restraint of free competitive bidding in connection with this proposal  
submitted to the City of Newark on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

Signature of Bidder: \_\_\_\_\_

By: \_\_\_\_\_  
Its legally authorized representative

Sworn to and subscribed before me on this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_.

My Commission expires \_\_\_\_\_

\_\_\_\_\_  
Notary Public

CITY OF NEWARK  
Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

Specification for the

Installation of Reinforced Concrete Pipe, High Density Polyethylene Pipe, Drainage Inlets, and Manholes

**1. SCOPE OF WORK**

The Scope of Work consists of furnishing all materials and equipment and performing all labor necessary for the installation of the storm sewer pipes, structures, and appurtenances to complete the work within the limits shown on the plans and as specified. The work shall include removal existing concrete curb and gutter, sidewalk, pavement, entrance aprons, CMP, drainage inlets, and manholes. Work shall also include additional measures to properly install proposed drainage facilities such as ditching, diking, shoring, bracing, pumping, bailing, draining, flushing, and final inspection. The shall take all necessary precautions to protect and maintain buildings, fences, entrances, structures, and all existing utilities. The work shall also include replacing and restoring, as required by the City of Newark and DelDOT, pavement, curbs, curb ramps, sidewalks, topsoil, seeding, and mulching, along with the removal and proper disposal of all rubbish and surplus material. The contractor shall furnish all materials, tools, equipment, and labor required to construct in complete working order, the storm sewer pipe and all structures pertaining thereto.

**2. EXCAVATION, BACKFILLING, AND COMPACTION**

- a. Excavation - Excavate pipe trench in accordance with the details as shown on the construction plans. Unsuitable foundation material shall be removed from below the bottom of trench elevation shown on the Plans, or as directed by the Engineer.
- b. Shoring - Remove all temporary shoring and bracing upon completion of the work, unless otherwise directed by the Engineer. Submit formal request, for approval by the Engineer, if shoring and bracing is to be requested to remain in place.
- c. Backfilling – Pipe trenches shall be backfilled with material conforming to the requirements of clean granular earth, sand or stone, and shall be solidly tamped above the pipe up to a level one foot above the top of the pipes. Backfill material shall be carefully placed in uniform 6" layers, each layer solidly tamped or rammed with proper tools so as not to injure or disturb the pipe line. The remainder of the backfilling of the trench shall be carried on simultaneously on both sides of the pipes in such a manner that injurious side pressures do



not occur. If the existing material meets these requirements, it shall be used for pipe backfill. Additional material for backfilling the pipe trenches shall be furnished by the Contractor. Materials shall be stockpiled at a location(s) mutually agreed upon by the Contractor, the City. Backfilling across City-owned paved surfaces and streets shall be as shown on the contract drawings. Backfilling across state owned streets shall meet the requirements set forth by DelDOT and in accordance with Section 601.03.6 Backfill of DelDOT's Standards and Specifications (2016).

### **3. REINFORCED CONCRETE PIPE**

- a. Furnish and install pipe Culverts and flared end sections where shown in the Contract Documents. This Work also includes the construction of connections to existing and proposed drainage inlets and manholes as may be required to complete the Work.
- b. Excavate the pipe trench and construct bedding in accordance with these specifications and the Contract Documents. Remove any unsuitable material encountered below the proposed bedding of the pipe and replace as directed by the Engineer.
- c. Before laying the pipe in the trench, attach the rubber gasket to the spigot end of each pipe joint and set firmly against the shoulder around the entire circumference of the pipe joint. Prior to installation, the Contractor may apply a lubricant specified by the gasket manufacturer to the gasket for ease of installation.
- d. Carefully control pipe handling after the gasket has been affixed to avoid bumping the gasket and thus displacing it or covering it with dirt or other foreign material. Remove any gasket so disturbed and reposition if displaced or replace if damaged. Apply sufficient pressure in making the joint to ensure that the joint is tight.
- e. Lay all pipe in accordance with the Contract Documents, requirements of ASTM D2321, or manufacturer's guidelines, whichever is more stringent, and in an upgrade direction. Lay the pipe with the lowest point of the inside diameter conforming to the flow line shown in the Contract Documents. Carefully lay all pipe with the bell ends upgrade, with the spigot ends fully entered into the adjoining bell, and true to the lines and grades shown in the Contract Documents or as directed by the Engineer. Remove and reinstall any pipe that is not in true alignment or that shows any settlement after placement.

### **4. HIGH DENSITY POLYETHYLENE PIPE**

- a. Provide only watertight joints when installing pipe. For type S or D pipes, use gasketed watertight bell/spigot or bell/bell couplers. Provide a joint system that has sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joint.
- b. For type C pipe, use bell and spigot, split-collar, or screw-on collar couplings that are corrugated to match the pipe corrugations and that provide sufficient longitudinal strength

to preserve pipe alignment and prevent separation at the joint. For split-collar couplings, engage at least two full corrugations on each pipe section. Screw-on collars shall have a width of at least one-half the nominal diameter of the pipe.

- c. Install pipe per Contract Documents and in accordance with the requirements of ASTM D2321 or the manufacturer's published guidelines, whichever are more stringent. Lay all pipe in an upgrade direction. Lay the pipe with the lowest point of the inside diameter conforming to the flow line shown in the Contract Documents. Lay all pipe carefully with the bell ends upgrade, with the spigot ends fully entered into the adjoining bell, and true to the lines and grades shown in the Contract Documents or as directed by the Engineer. Remove and relay any pipe that is not in true alignment or that shows any settlement after laying.
- d. In addition to the backfilling requirements in section 2, place an initial backfill lift that does not exceed 12 inches of loose material and is not higher than the spring line of the pipe. Slice the Material into the haunches of the pipe using a shovel. Place a maximum of 6 inches of loose material for each remaining lift. Take caution not to hit the pipe with any mechanical compaction equipment or to disturb the alignment of the pipe.

## **5. DRAINAGE INLETS AND MANHOLES**

- a. Prior to fabrication, submit Working Drawings that include dimensions in accordance with the contract documents and City of Newark standards. Use drainage inlet frames and grates and manhole frames and covers that are capable of meeting or exceeding HS-20 load rating requirements in accordance with AASHTO M306.
- b. Excavate to the required depth in accordance with the contract documents. Compact the foundation upon which the concrete floor of the Structure is to be placed to a firm, even surface to the acceptance of the Engineer.
- c. Place the Structure as shown in the Contract Documents. Use cast-in-place construction for drainage structures that tie in to existing pipes and structures unless otherwise specified in the Contract Documents or if the Engineer approves the use of precast Structures. Use precast Structures for all new construction unless otherwise specified in the Contract Documents or directed by the Engineer.
- d. Provide precast reinforced concrete round manhole riser sections and appurtenances in accordance with AASHTO M199.
- e. Set the frames of castings in concrete.
- f. Install steps on the backwall for all drainage inlets and manholes that are 4 feet or more in depth, measured from the top of grate or cover to the invert of the lowest pipe. Provide a minimum embedment of 3 inches in the wall and ensure that the steps protrude out 6 inches from the wall. Begin steps within 24 inches of the top of grate/lid and end steps no more

than 12 inches above the lowest invert except where a pipe is in the backwall. Space steps vertically at 12-inch intervals.

- g. Ensure inlet and outlet pipes are the same size and type as the connecting pipes shown in the Contract Documents and that pipes extend through the walls and are flush with the inside of the wall. When the end of a reinforced concrete pipe is cut off, ensure that the end is cut clean and smoothly finished with mortar so that no bar reinforcement remains exposed. Fill any space between the pipe and the walls of the drainage inlet with non-shrink grout with a minimum strength of 5000 pounds per square inch. Ensure that the greatest dimension of the opening in the drainage inlet for the pipe is no greater than the outside pipe diameter plus 4 inches.
- h. Pour flow channel.
- i. Backfill the area around drainage inlets and manholes with material conforming to the requirements of clean granular earth, sand or stone to the required elevation in accordance with the Contract Documents and Section 2 of the specifications.

## **6. TEST PITS**

The location, size, and depth of existing utilities shown on the plan is based on best available information. Test pits shall be the responsibility of the contractor and be completed as necessary to determine the location and elevation of utilities in the construction area. The contractor should rely on its own expertise to determine need for test pits. Restoration of test pit areas shall be as per the details on the drawings and return the test pitted area back to the ground surface elevation, conditions, structures, and vegetative coverage back to its existing conditions prior to test pitting or as detailed on the project plans.

## **7. MAINTENANCE OF TRAFFIC**

The road, while undergoing improvements, shall be kept open to all traffic by the contractor unless otherwise directed by the City. The contractor shall keep the portion of the road being used by public traffic in such condition that traffic will be adequately accommodated. He shall also provide and maintain in a safe condition temporary approaches to crossings, intersections, roads, streets, businesses, parking lots, residences, garages, etc.

In carrying on the work, the contractor shall interfere as little as possible with traffic. The contractor shall provide and maintain ingress and egress for all residences and places of business located along the construction route. So far as practicable, materials stored upon the roadway shall be placed so as to cause as little obstruction to the traveling public as possible. If it is necessary to keep the road or any portion of it closed to travel during the construction thereof, the contractor shall so carry on the work and provide such means that travel will not be obstructed or endangered. Buses and emergency vehicles shall have access to the road at all times during construction. The contractor

shall provide and maintain in an acceptable condition such temporary roadways and bridges as may be necessary to accommodate the traffic using or diverted from the roadway under construction and shall provide and maintain in a safe condition temporary approaches to and crossing of intersecting highways. Fire hydrants on or adjacent to the roadway shall be kept accessible within 15 feet of any such hydrant. The contractor shall not disturb the surface of an existing road farther in advance of the new construction than can be completed in a reasonable length of time as determined by the engineer. The contractor shall provide and maintain properly illuminated signs and barricades for the information, protection, and safety of the traveling public, conforming to the City's practices for street and road construction.

## **8. AS-BUILT DRAWINGS**

The Contractor shall submit field sketch as-built plans of all installed items. The plans shall contain the measured location of the storm pipe installed within the project. The City shall contract separately for the final certified as-built survey.

## **9. HANDICAP RAMPS**

All Handicap Ramps must comply with current Americans with Disability Act and contractor must notify Newark's Inspector of all ramp installations a minimum of 24 hours prior to curb ramp installation. Handicap Ramp work on State maintained roadways shall be in accordance with the latest DelDOT specifications.

## **10. METHOD OF MEASUREMENT AND INCIDENTALS DETERMINATION**

The measurement of payment shall be for the installation of the materials listed in the Proposal in accordance with the units indicated as described in the proposal.

The quantity of pipe installation will be measured as the actual number of linear feet of each type of pipe placed and accepted, measured from end to end of pipe, including structure wall thickness, but excluding structure interior and flared end sections. Removal and disposal of the existing CMP shall be incidental to the installation of the new pipe. Road restoration shall be incidental to the quantity of pipe installation.

The quantity of flared end sections will be measured as the actual number placed and accepted.

The quantity of riprap installed will be measured as the as the actual square yardage of riprap installed as measured from a planimetric viewpoint.

Removal and replacement of curb, gutters, sidewalk, will be measured as the actual quantity removed, installed, and accepted. and residential driveway aprons shall be incidental to the installation of the new pipe.

Removal and re-setting of mailboxes and traffic signs shall be incidental to the installation of the

new pipe.

The quantity of drainage inlets and manholes will be measured as the actual number of each installed and accepted. Drainage inlet frames and grates and manhole frames and covers are included in the Items and will not be measured.

Restoration of vegetated surfaces will include 6" of topsoil, grass seed, and mulch and shall be incidental to the installation of the new pipe.

#### **11. BASIS OF PAYMENT**

Payment for these items shall be included in the unit prices for each item as described in the Proposal.

All other items, methods, and materials necessary to complete the work as described above shall be incidental to the bid item the work is being completed under.

The Owner reserves the right to delete from the Contract one or more items listed and the right to add or subtract from the quantity of each item. The total price to be paid will be adjusted in accordance with the Contractor's unit prices as required above. There will be no extra compensation or increase in unit prices in the Proposal if such additions and/or deletions are made to quantities.

Application and Certification for Payment shall be made on proper AIA Documents.

CITY OF NEWARK  
Delaware

CONTRACT NO. 18-07

CMP STORM SEWER REHABILITATION - 2018

Attachment 1

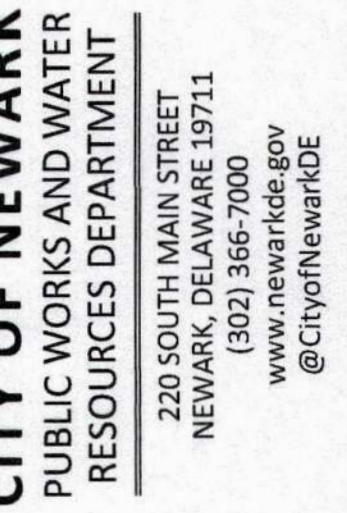
Construction Plans





# CMP STORM SEWER REHABILITATION - 2018

CONTRACT NO. 18-07

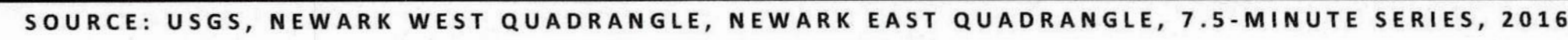


1. ALL CONSTRUCTION, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH THE CITY OF NEWARK DEPARTMENT OF PUBLIC WORKS AND WATER RESOURCES DEPARTMENT DETAIL STANDARDS FOR ROAD AND UTILITY CONSTRUCTION, DETAILS AND SUPPLEMENTS.
2. DRAWINGS HAVE BEEN CREATED FROM TOPOGRAPHIC SURVEY, THE DELAWARE GEOSPATIAL DATA EXCHANGE GIS INFORMATION, CITY OF NEWARK WATER, SANITARY SEWER AND STORM SEWER PLANS AND BEST AVAILABLE INFORMATION. ADDITIONAL BURIED UTILITIES OR STRUCTURES MAY BE ENCOUNTERED, NO EXCAVATIONS WERE CONDUCTED DURING THE PREPARATION OF THESE PLANS. THE CONTRACTOR SHALL VERIFY ALL INFORMATION TO HIS/HER OWN SATISFACTION, EXACT LOCATION AND COMPLETENESS. THE CONTRACTOR SHALL BE RESPONSIBLE TO BE AWARE THAT ANY TRASH AND COMCAST COMMUNICATION UTILITIES ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL INFORMATION THAT MAY AFFECT WORK.
3. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH HAVE OCCURRED BY HIS/HER FAILURE NOT TO EXCAVATE LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES AFFECTING HIS/HER WORK. ITEMS SHALL BE REPLACED WITH THE SAME TYPE OF MATERIAL THAT WAS REMOVED OR DAMAGED DURING CONSTRUCTION OR AS SPECIFIED BY THE ENGINEER.
4. CONTRACTOR IS RESPONSIBLE FOR CONTACTING "MISS UTILITY" AT 1-800-282-8555, 48 HOURS PRIOR TO ANY EXCAVATION WORK.
5. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE LOCATION AND ACTIVITIES OF HIS FORCES WITH THE OWNER, AND ABUTTING PROPERTY OWNERS TO MINIMIZE INTERFERENCE WITH EXISTING UTILITIES, PEDESTRIAN TRAFFIC, AND PROPERTY ACCESS. PEDESTRIAN AND VEHICLE ACCESS SHALL BE MAINTAINED AT ALL TIMES. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CITY OF NEWARK DEPARTMENT OF PUBLIC WORKS AND WATER RESOURCES PROJECT MANAGER ETHEL ROBINSON AT 302-366-7000, 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
6. CONTRACTOR SHALL SUBMIT AS-BUILT SKETCH PLANS OF ALL INSTALLED ITEMS. THE SKETCHES SHALL CONTAIN THE LOCATION OF THE DRAINAGE INLETS, MANHOLES AND PIPE INSTALLED WITHIN THE PROJECT.
7. THE PLANS AND SPECIFICATIONS DO NOT INCLUDE PROVISIONS FOR CONSTRUCTION SAFETY. A HEALTH AND SAFETY PLAN MUST BE SUBMITTED BY THE CONTRACTOR PRIOR TO STARTING CONSTRUCTION.
8. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING UTILITIES, CURBS, SIDEWALK, PAVING, SHRUBS, FENCING, ETC. ANY AND ALL DAMAGE DUE TO SAME SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL ACQUIRE ALL PERMITS PRIOR TO STARTING CONSTRUCTION AT NO COST TO THE CITY OF NEWARK.
10. METHODS, PROCEDURES AND THE SEQUENCES OF CONSTRUCTION (OTHER THAN THAT NOTED ON THE DRAWINGS) ARE THE RESPONSIBILITY OF THE CONTRACTOR(S).
11. ROADWAYS SHALL BE KEPT CLEAN AT ALL TIMES. ALL SOIL SPILL, DROPPED, WASHED OR TRACKED ONTO ROADWAYS OR THE INTERSECTIONS THEREOF SHALL BE REMOVED IMMEDIATELY.
12. ALL WORK SHALL BE CONDUCTED IN THE PUBLIC RIGHT OF WAY OR UTILITY EASEMENT. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL TEMPORARY CONSTRUCTION EASEMENTS TO PERFORM WORK OUTSIDE THE PUBLIC RIGHT OF WAY.
13. ALL REMOVED DRAINAGE INLETS, MANHOLES, PIPE SECTIONS, CURB, SIDEWALK, AND ROAD BED MATERIAL SHALL BE PROPERLY DISPOSED OF OFF SITE. PAYMENT FOR REMOVAL, HAULING, AND DISPOSAL SHALL BE INCIDENTAL TO THE PIPE INSTALLATION COST.
14. ALL DEBRIS SHALL BE REMOVED ON A DAILY BASIS TO MINIMIZE TRAFFIC INTERRUPTIONS. CONTRACTOR IS RESPONSIBLE FOR SECURING STORAGE AND STAGING AREAS AT HIS OWN EXPENSE.
15. CONTRACTOR SHALL PROTECT AND MAINTAIN EXISTING STREET LIGHTING AND TRAFFIC SIGNAL FACILITIES. ANY STREET LIGHTING AND TRAFFIC SIGNAL EQUIPMENT, CABLE, AND CONDUIT FACILITIES AFFECTED BY UTILITY CONSTRUCTION SHALL BE REPLACED IN KIND AT THE SOLE EXPENSE OF THE CONTRACTOR.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A JOBSITE FREE OF LITTER AND TRASH. THE CONTRACTOR IS RESPONSIBLE FOR REMEDIATING THE SITE AT THE END OF THE DAY TO CLEAN UP ANY TRASH OR LITTER GENERATED BY THE PERSONNEL AND SUBCONTRACTORS WORKING FOR THE CONTRACTOR.

1. THE CONTRACTOR IS PERMITTED TO USE STEEL ROADWAY PLATES AT THE PROJECT SITES TO PROTECT OPENINGS IN AN EFFORT TO EXPEDITE THE INSTALLATION OF STORM SEWER CONDUIT FOR DAY TO DAY OPERATIONS. STEEL ROADWAY PLATES SHALL BE SECURED AND PROPERLY MAINTAINED TO PREVENT ANY DAMAGE TO THE ROADWAY. THE PAYMENT TO FURNISH, PLACE, MAINTAIN, AND REMOVE STEEL ROADWAY PLATES SHALL BE INCIDENTAL TO THE PIPE INSTALLATION.
2. THE CONTRACTOR SHALL REMOVE AND RESET ALL MAILBOXES TO MAINTAIN MAIL SERVICE AND TO NOT IMPED PEDESTAL ACCESS. PAYMENT FOR THE REMOVAL AND RESETTING OF MAILBOXES SHALL BE INCIDENTAL TO THE PIPE INSTALLATION
3. DRAINAGE INLET GRADES WITHIN THE PROJECT LIMITS WHICH ARE NOT DELDOT TYPE 1 OR TYPE 4, SHALL BE REPLACED. REPLACEMENT INLET PIPES SHALL BE 18" DIAMETER AND SHALL BE MAINTAINED IN THE MAINTENANCE YARD ON PHILLIPS AVENUE. PAYMENT SHALL BE INCIDENTAL TO INLET AND MANHOLE REPLACEMENT ITEMS.
4. PROPOSED INLETS, MANHOLES, AND PIPES SHALL BE REPLACED AT THE SAME LOCATION, OFFSET, AND ELEVATION AS THE EXISTING FACILITIES.
5. IN AREAS WHERE PROPOSED CURB MEETS EXISTING CURB AND THE TWO CURB TYPES ARE NOT SIMILAR, THE PROPOSED CURB SHALL BE TRANSFERRED IN TO UNIFORM FEET, UNLESS OTHERWISE DIRECTED BY THE CITY.
6. WHERE PROPOSED CONCRETE SIDEWALK IS CONSTRUCTED TO MEET EXISTING SIDEWALK, THE EXISTING SIDEWALK SHALL BE SAWCUT AT THE TIE IN POINT OR MEET THE NEAREST EXISTING SIDEWALK JOINT UNLESS OTHERWISE DIRECTED BY THE CITY.

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES NECESSARY TO CONSTRUCT THE WORK OUTLINED IN THE PLANS AND SPECIFICATIONS IN ACCORDANCE WITH THE 3.06.1 DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, APRIL 2016, (INREC) INCLUDING ALL REVISIONS FOLLOWING THIS DATE AND THESE PLANS. PAYMENT TO FURNISH, INSTALL, MAINTAIN AND REMOVE ALL NECESSARY EROSION AND SEDIMENT CONTROL DEVICES/MEASURES SHALL BE INCIDENTAL TO THE WORK BEING PERFORMED AT EACH SITE PER PLANS.
2. ALL DISTURBED AREAS SHALL BE ADEQUATELY STABILIZED AS APPROVED BY THE CITY PRIOR TO PROCEEDING TO THE NEXT LOCATION.
3. THE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL VEGETATIVE STABILIZATION OF ALL DISTURBED AREAS AND WITH CONSENT FROM THE CITY.
4. THE CONTRACTOR SHALL INSPECT THE INTEGRITY AND FUNCTIONALITY OF E&S MEASURES FOLLOWING RAIN EVENTS. REPAIRS SHALL BE MADE AS NECESSARY. PAYMENT FOR REPAIRING OR REPLACEMENT OF E&S MEASURES SHALL BE INCIDENTAL TO THE WORK BEING PERFORMED AT EACH SITE PER PLANS.
5. IT IS ANTICIPATED THAT NO DESIGNATED STOCKPILE AREA IS REQUIRED, AND THE EXCAVATED MATERIAL SHALL NOT BE STOCKPILED OVERNIGHT.
6. EXISTING TREES, BUSHES, AND SHRUBS SHALL BE PROTECTED BY THE CONTRACTOR FROM ALL DAMAGE UNLESS IN DIRECT CONFLICT WITH STORM SURGE REMOVAL AND INSTALLATION.

1. THIS SURVEY WAS BASED ON A FIELD-RUN TOPOGRAPHIC SURVEY PERFORMED BY JOHNSON, MIRMIRAN & THOMPSON (JMT) ON JANUARY 22, 23 & 26, 2018 AND REFLECTS SITE CONDITIONS AS OF THAT DATE.
2. COORDINATES ARE REFERENCED TO THE DELAWARE STATE PLANE COORDINATE SYSTEM NAD 83(2011) ZONE 0600 EPOCH 2010 AS DETERMINED BY GPS RTN (KEYNET) OBSERVATIONS ON JANUARY 22, 23 & 26, 2018.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88S)(GEOID 128) AS DETERMINED BY GPS RTN (KEYNET) OBSERVATIONS ON JANUARY 22 & 23, 2018.
4. ALL PIPE SIZES ARE APPROXIMATE. NO RECORD DRAWINGS WERE UTILIZED IN THE MAPPING OF THIS TOPOGRAPHICAL SURVEY.
5. ALL UTILITY LINE ELEVATIONS ARE VOID UNLESS OTHERWISE NOTED HEREON.
6. ADDITIONAL SPOT ELEVATIONS RESIDE IN THE ELECTRONIC VERSION OF THIS DRAWING BUT ARE NOT PLOTTED HEREON.



<b>POINT</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEV.</b>	<b>DESCRIPTION</b>
JMT 1	619633.05	557255.05	264.64	MAGNAIL
JMT 2	619987.65	557085.10	268.73	MAGNAIL
JMT 3	619746.26	557477.06	257.06	REBAR & CAP
JMT 4	619855.42	556971.20	260.99	REBAR & CAP
JMT 5	620174.21	556821.12	260.94	REBAR & CAP
JMT 6	616745.48	566593.96	66.45	MAGNAIL
JMT 7	616798.54	566921.02	68.07	REBAR & CAP
JMT 8	616044.86	565409.70	68.32	MAGNAIL
JMT 9	615882.54	565418.35	59.84	REBAR & CAP

SHEET INDEX	
SHEET	TITLE
1	COVER SHEET
2	SITE PLAN - AREA 1
3	SITE PLAN - AREA 2
4	SITE PLAN - AREA 3
5	PROFILE VIEWS
6	CONSTRUCTION DETAILS
7	EROSION & SEDIMENT CONTROL DETAILS

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CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST CITY OF NEWARK STANDARDS AND SPECIFICATIONS AND IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THERETO.

DATE: 2018-09-06

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SCALE: 1" = 1/4 MILE

DRAWN BY: MWF

APPROVED BY: EJR

**C001**

**GOOI**

SHEET 1 OF 7

u:\capital projects\q - stormwater\q1301 - storm drainage improvements\cmp storm sewer rehabilitation 2018\DESIGN\PUBLISH\G001.dwg PLOTTED: September 6, 2018







u:\capital projects\q - stormwater\q1301 - storm drainage improvements\cmap storm sewer rehabilitation 2018\DESIGN\publish\C102.dwg PLOTTED: September 6, 2018



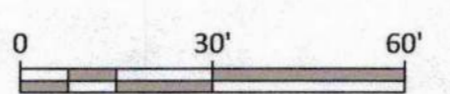
**MISS UTILITY  
OF  
DELMARVA**




**BEFORE YOU DIG CALL**  
1-800-282-8555  
PROTECT YOURSELF, GIVE TWO  
WORKING DAYS NOTICE


WORK ITEMS		
ITEM NO.	QUANTITY	DESCRIPTION
	28 LF	REMOVE 15" CMP AND INSTALL 15" RCP
	33 LF	REMOVE 20" CMP AND INSTALL 21" RCP
	44 LF	REMOVE AND INSTALL INTEGRAL CURB & GUTTER
	2 EA	REPLACE EXISTING DOUBLE CATCH BASIN CURB INLET
	2 EA	REPLACE CATCH BASIN "NO DUMPING" STICKER

NOTES:  
1. PLACE 6-INCHES OF TOPSOIL AND PERMANENT GRASS SEED AND MULCH TO FINISHED GRADE ON ALL AREAS DISTURBED AS PART OF THIS PROJECT.





**CITY OF NEWARK**  
PUBLIC WORKS AND WATER  
RESOURCES DEPARTMENT  
220 SOUTH MAIN STREET  
NEWARK, DELAWARE 19711  
www.newarkde.gov  
@CityofNewarkDE



NO.	DATE	REVISIONS	BY

**CMP STORM SEWER REHABILITATION - 2018**  
CONTRACT NO. 18-07

**SITE PLAN - AREA 2**

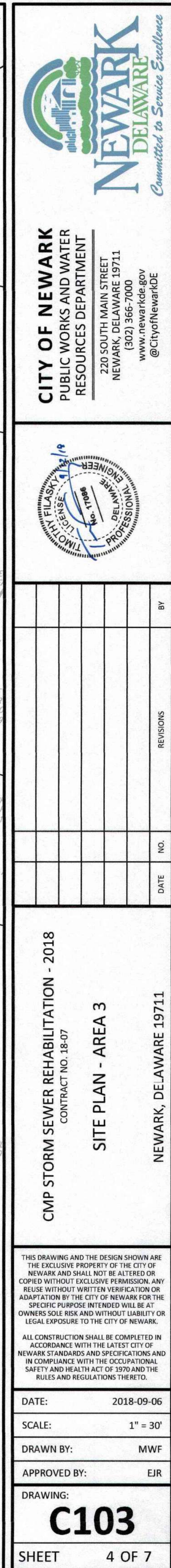
NEWARK, DELAWARE 19711

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DATE:	2018-09-06
SCALE:	1" = 30'
DRAWN BY:	MWF
APPROVED BY:	EIR
DRAWING:	<b>C102</b>
SHEET	3 OF 7

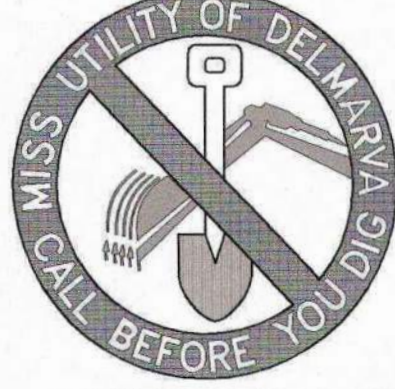




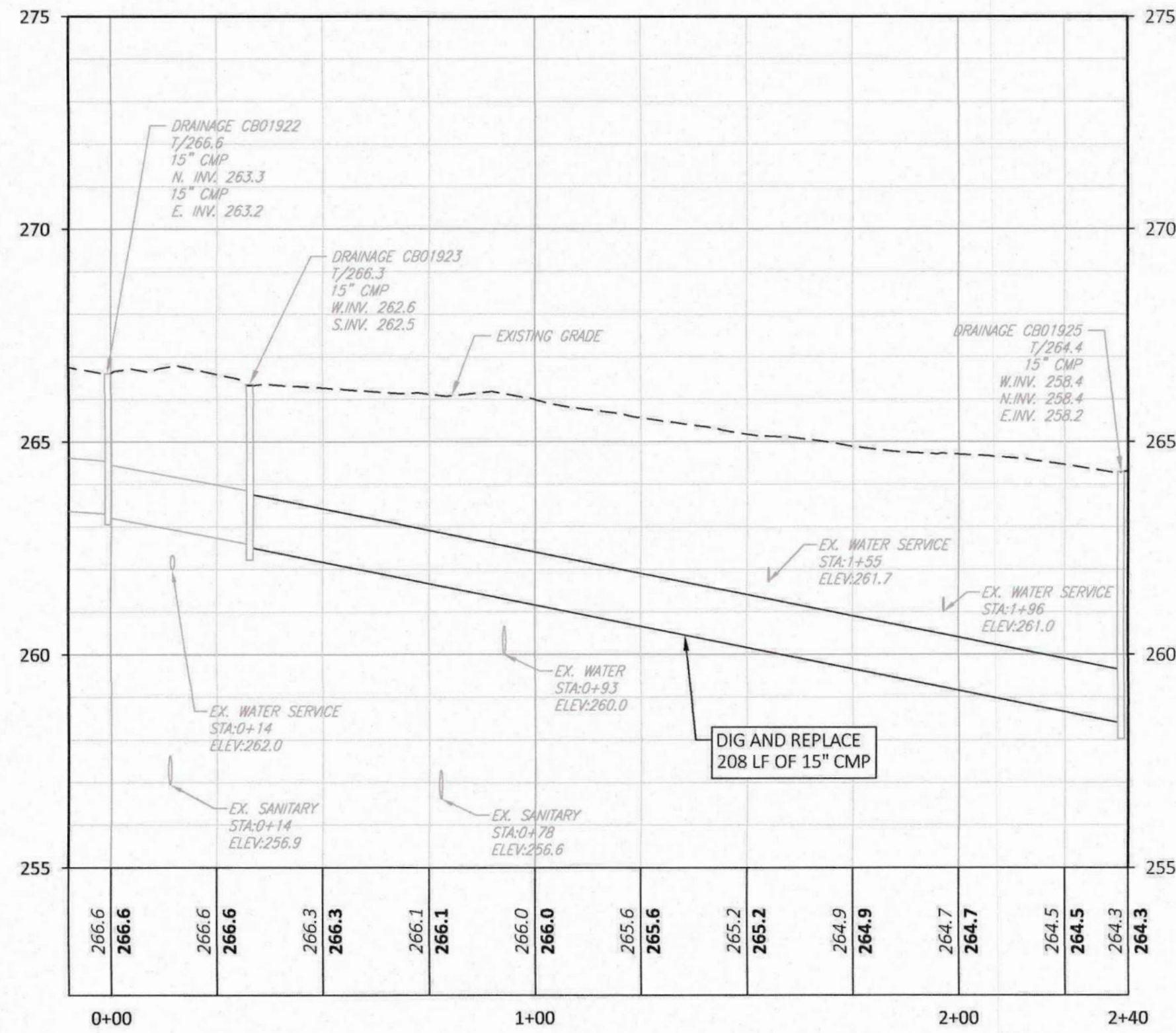


u:\capital projects\1 - stormwater\q1301 - storm drainage improvements\cmp storm sewer rehabilitation\cmp storm sewer rehabilitation\2018\DESIGN\publish\c201.dwg PLOTTED: September 6, 2018

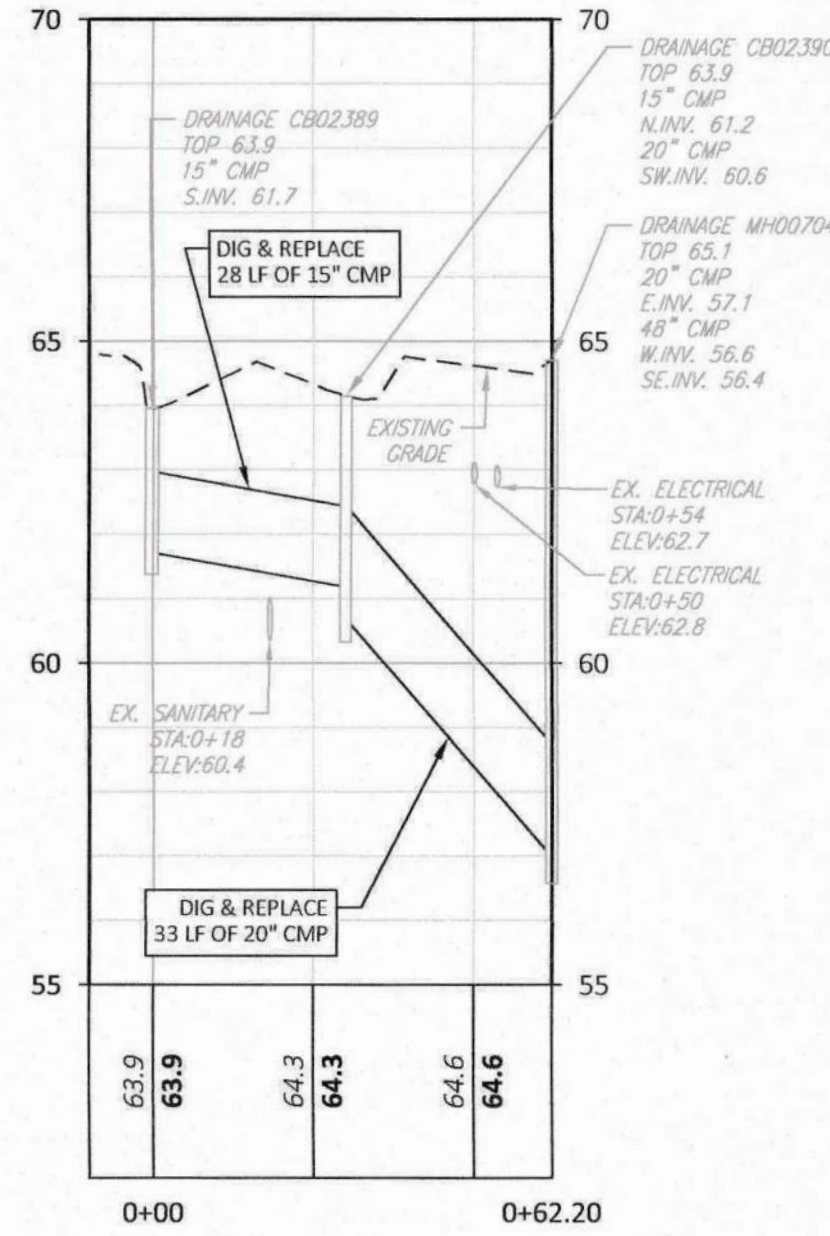
MISS UTILITY  
OF  
DELMARVA



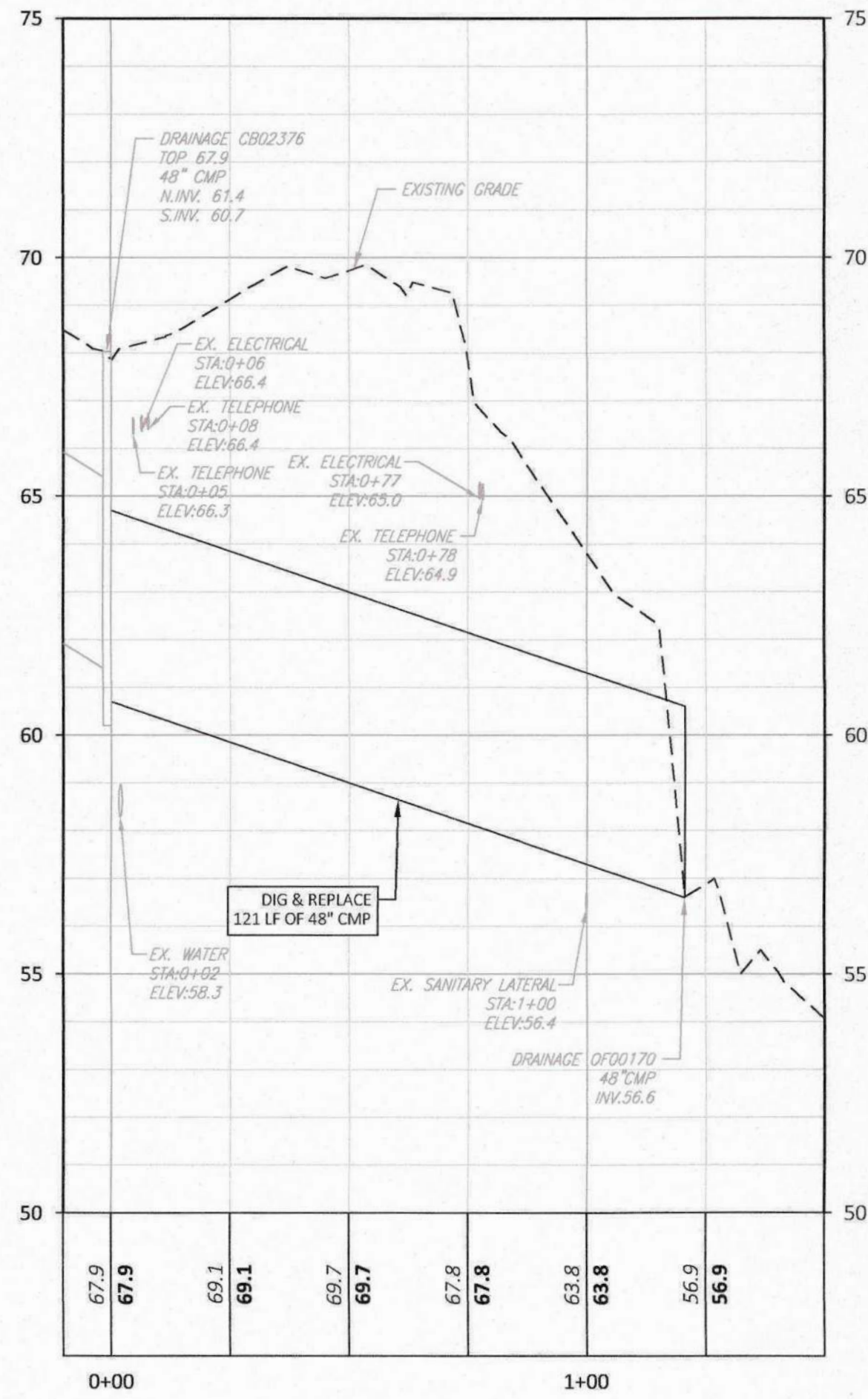
BEFORE YOU DIG CALL  
1-800-282-8555  
PROTECT YOURSELF, GIVE TWO  
WORKING DAYS NOTICE



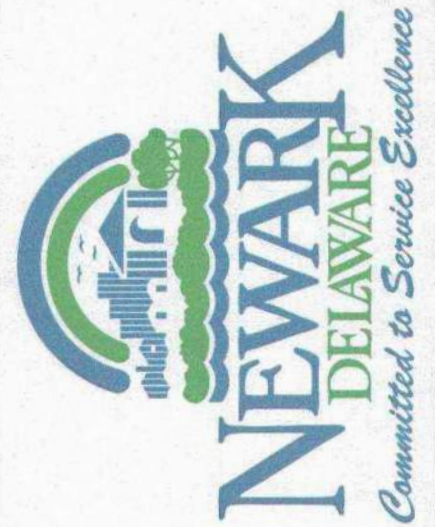
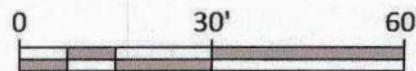
PROFILE VIEW (AREA 1: CB3964-CB1925)  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=3'



PROFILE VIEW (AREA 2: CB2389-MH704)  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=3'



PROFILE VIEW (AREA 3: CB2376-OF170)  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=3'



CITY OF NEWARK  
PUBLIC WORKS AND WATER  
RESOURCES DEPARTMENT  
220 SOUTH MAIN STREET  
NEWARK, DELAWARE 19711  
(302) 366-7000  
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NO.	DATE	REVISIONS	BY

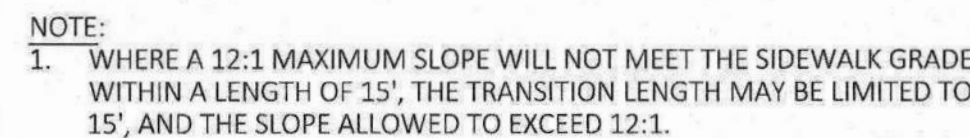
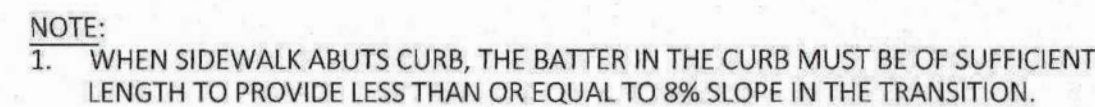
CMP STORM SEWER REHABILITATION - 2018  
CONTRACT NO. 18-07  
PROFILE VIEWS  
NEWARK, DELAWARE 19711

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DATE: 2018-09-06  
SCALE: 1" = 30'  
DRAWN BY: MWF  
APPROVED BY: EJR

DRAWING:  
**C201**  
SHEET 5 OF 7

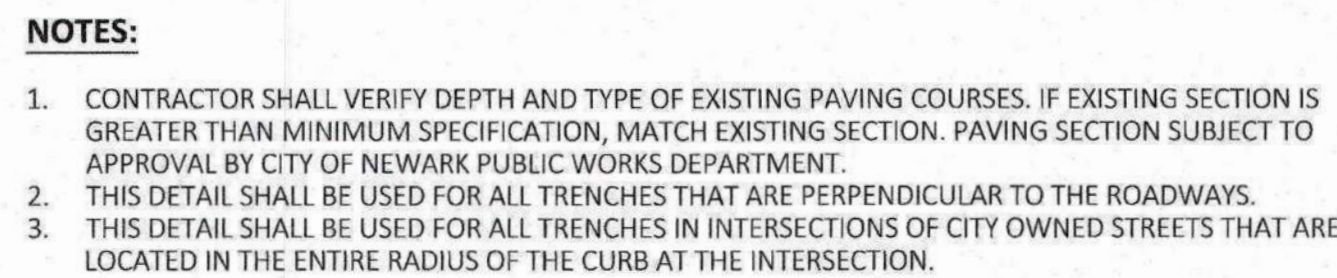




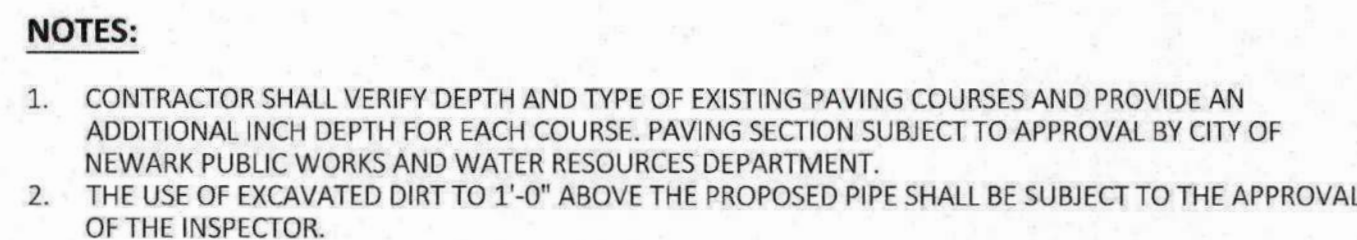
**FRONT VIEW AT FACE OF INTEGRAL CURB & GUTTER**

**NOTES:**

1. CONCRETE SHALL BE 3500#.
2. EXPANSION JOINT SHALL BE PROVIDED ALONG WALKWAYS EVERY 20 FEET FOR CONCRETE PAVEMENT.
3. MINIMUM THICKNESS FOR CONCRETE WALKWAYS IS 4 INCHES.
4. SINGLE DRIVEWAY WIDTH IS 10 FEET.
5. DOUBLE DRIVEWAY WIDTH IS 18 FEET.
6. EXPANSION JOINT SHALL BE PROVIDED EVERY 20 FEET MINIMUM FOR CONCRETE DRIVEWAYS.



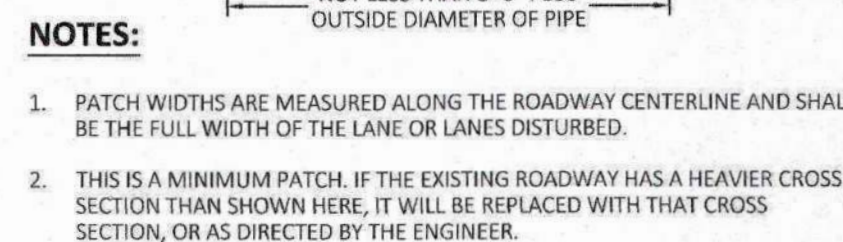
**STREAM TRANSITION SECTION**  
NOT TO SCALE



**NOTES:**

1. CONTRACTOR SHALL VERIFY DEPTH AND TYPE OF EXISTING PAVING COURSES AND PROVIDE AN ADDITIONAL INCH DEPTH FOR EACH COURSE. PAVING SECTION SUBJECT TO APPROVAL BY CITY OF NEWARK PUBLIC WORKS AND WATER RESOURCES DEPARTMENT.

Source:  
Adapted from  
FBIWA HEC-14



**UTILITY TRENCH**  
NOT TO SCALE

### Construction Notes

1. The subgrade for the riprap shall be prepared to the required lines and grades as shown on the plan. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
2. The riprap shall conform to the grading limits as shown on the plan.
3. Geotextile shall be a type GS-1. Fabric shall be protected from puncting, cutting or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire section.
4. Stone for the riprap or gabion outlets may be placed by equipment. Riprap shall be placed in a manner to prevent damage to the geotextile fabric. Hand placement will be required to the extent necessary to prevent damage to the conduits, structures, etc.
5. HORIZONTAL 3:1 FLARE FROM CULVERT WILL NOT BE ATTAINABLE. REFER TO GRADING ON SHEET C103 TO CONFORM GRADING TO NATURAL STREAM CHANNEL.

CMP STORM SEWER REHABILITATION - 2018  
CONTRACT NO. 18-07

## CONSTRUCTION DETAILS

NEWARK. DE AWARE 19711

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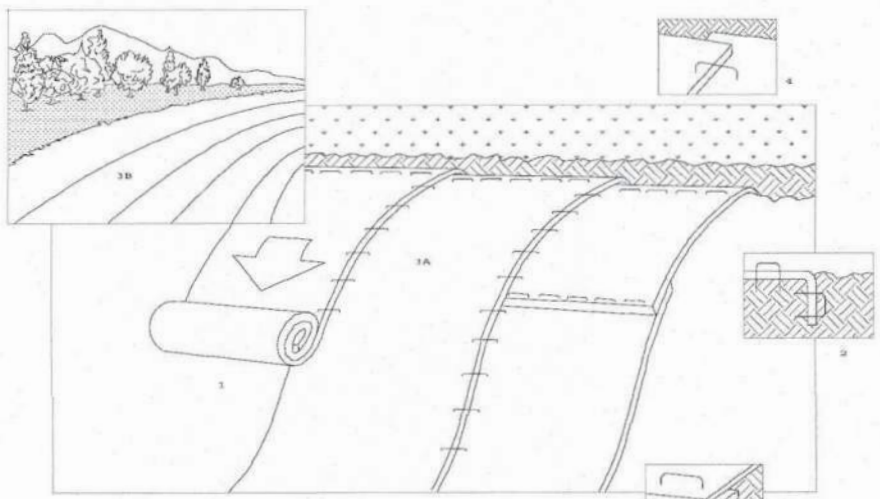
DATE:	2018-09-06
SCALE:	1" = 30'
DRAWN BY:	MWF
APPROVED BY:	EJR
DRAWING:	

# C501

SHEET 6 OF 7



## Standard Detail & Specifications Stabilization Matting - Slope



Note: Use manufacturer's recommendations for stapling patterns for slope installations.

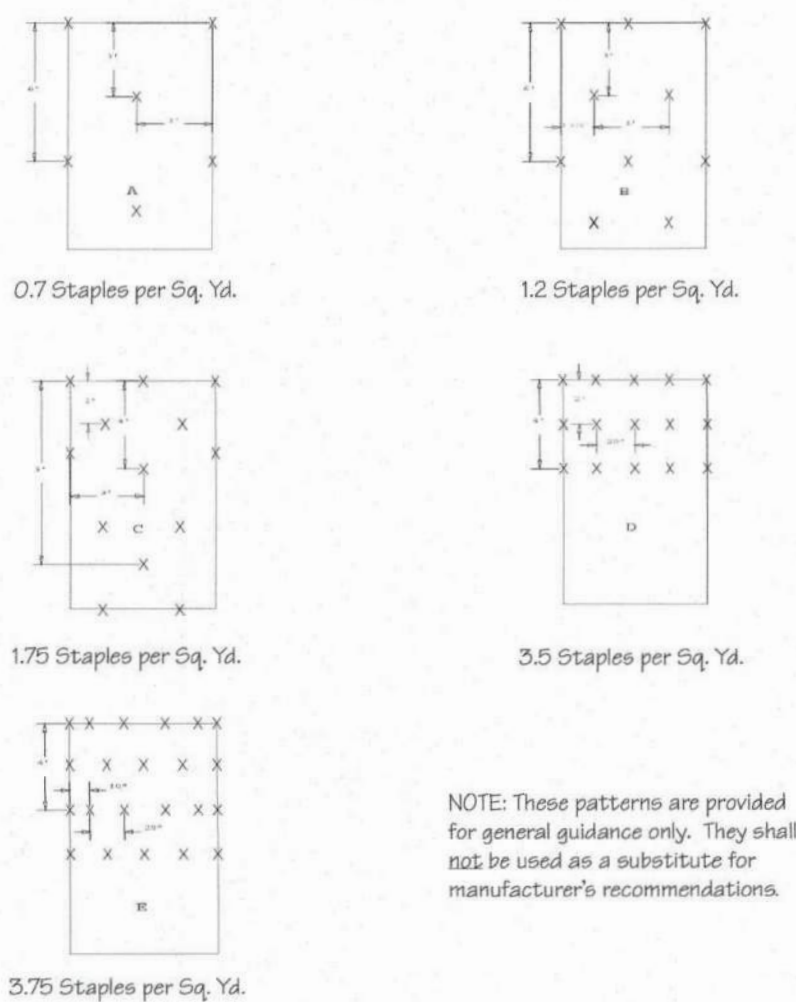
Perspective

### Construction Notes:

1. Prepare soil before installing matting, including application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact trench after stapling.
3. Roll the mats (A) down or (B) horizontally across the slope.
4. The edges of parallel mats must be stapled with approx. 2" overlap.
5. When mats must be spliced down the slope, place mats end over end (single style) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	<b>SM-S</b>	<b>DE-ESC-3.4.6.1</b> Sheet 1 of 2

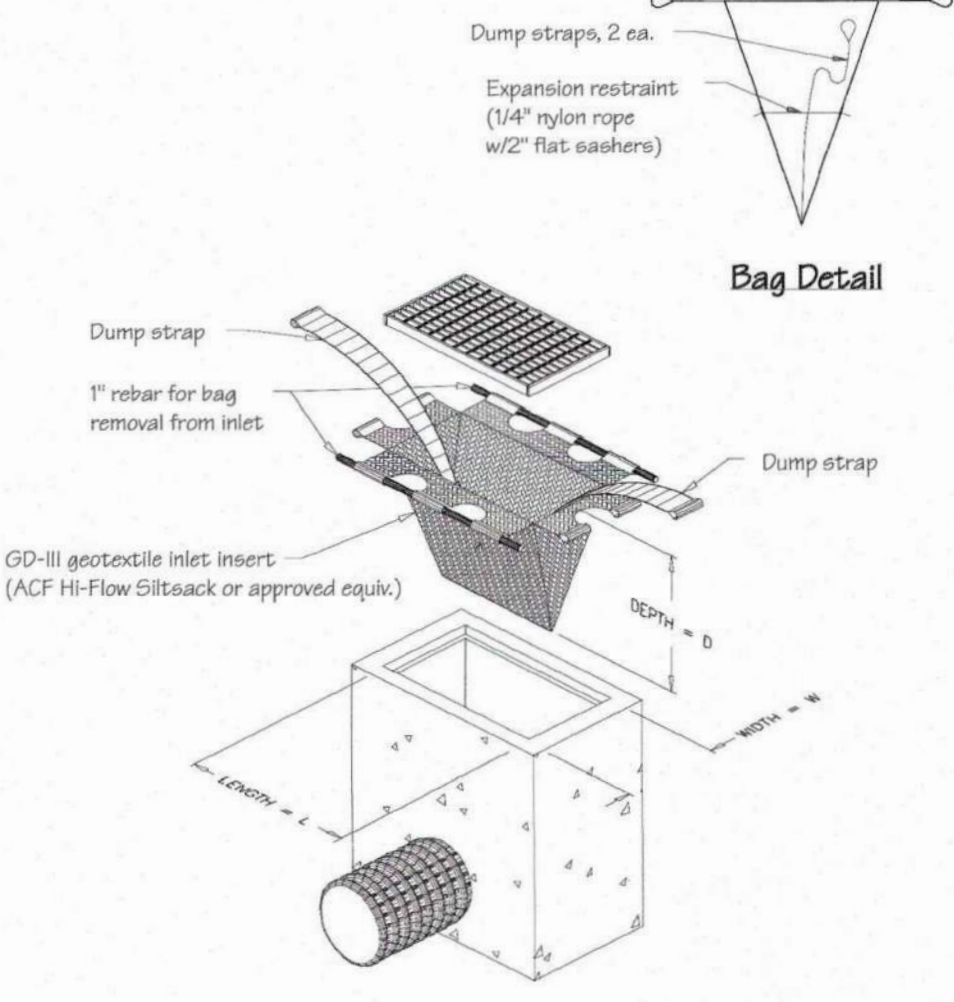
## Standard Detail & Specifications Stabilization Matting - Slope



Stapling Patterns

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	<b>SM-S</b>	<b>DE-ESC-3.4.6.1</b> Sheet 2 of 2

## Standard Detail & Specifications Inlet Protection - Type 2



Perspective

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	<b>IP-2</b>	<b>DE-ESC-3.1.5.2</b> Sheet 1 of 2

## Standard Detail & Specifications Inlet Protection - Type 2

### Notes:

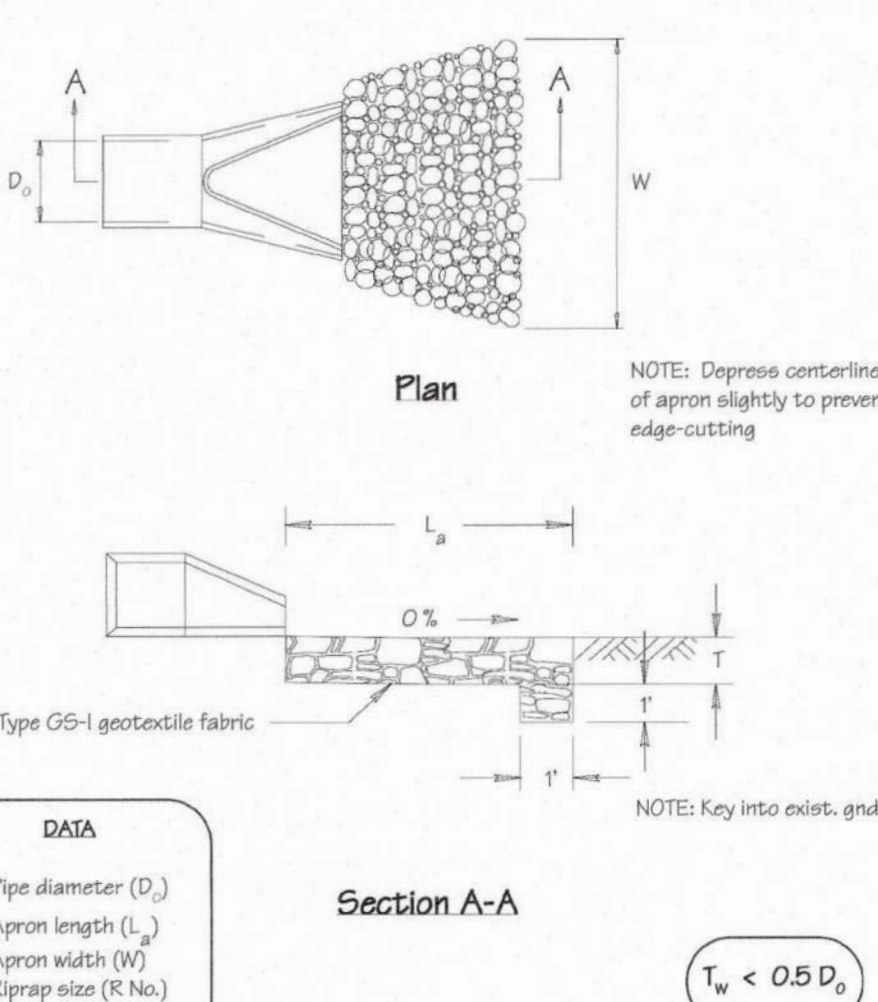
1. This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially completed parking areas, streets, roads, etc.
2. It may be necessary to transition from Type 1 to Type 2 Inlet Protection as construction proceeds.
3. For areas where there is a concern for oil run-off or spills, insert shall meet one of the above specifications with an oil-absorbent pillow or shall be made completely from an oil-absorbent material with a woven pillow.

### Materials:

The geotextile inlet insert shall meet or exceed the specifications of Type GD-II geotextile in accordance with Appendix A-3 of the Delaware Erosion & Sediment Control Handbook.

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	<b>IP-2</b>	<b>DE-ESC-3.1.5.2</b> Sheet 2 of 2

## Standard Detail & Specifications Riprap Outlet Protection - 1



Section A-A

Source:	Symbol:	Detail No.
Adapted from MD Sdks. & Specs. for ESC	<b>ROP-1</b>	<b>DE-ESC-3.3.10.1</b> Sheet 1 of 2

## Standard Detail & Specifications Riprap Outlet Protection - 1

### Construction Notes:

1. The subgrade for the riprap shall be prepared to the required lines and grades as shown on the plan. All fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
2. The riprap shall conform to the grading limits as shown on the plan.
3. Filter cloth shall be protected from punching, cutting or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire filter cloth.
4. Stone for the riprap or gabion outlets may be placed by equipment. Riprap shall be placed in a manner to prevent damage to the filter cloth. Hand placement will be required to the extent necessary to prevent damage to the conduits, structures, etc.

Source:	Symbol:	Detail No.
Adapted from MD Sdks. & Specs. for ESC	<b>ROP-1</b>	<b>DE-ESC-3.3.10.1</b> Sheet 2 of 2

## Standard Detail & Specifications Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES										
Mix #	Species <sup>1</sup>	Seeding Rate	Optimum Seeding Dates <sup>1</sup>						Planting Depth	
			O = Optimum Planting Period, A = Acceptable Planting Period							
			Grass Plant		Rudbeck		All			
Certified Seed		lb/ac <sup>1</sup>	3/10/00 96.9	3/15 450	3/20 514	3/25 578	3/30 643	4/4 707	4/9 771	4/14 835
1	Barley	125	4	O	A	O	A	O		1-2 inches
2	Oats	125	4	O	A	O	A	O	A	2-3" sandy soil
3	Rye	125	4	O	A	O	A	O	A	2-3" sandy soil
4	Perennial Ryegrass	125	4	O	A	O	A	O	A	0.5 inches
5	Annual Ryegrass	125	4	O	A	O	A	O	A	1-2" sandy soil
6	Winter Wheat	125	4	O	A	O	A	O	A	1-2 inches
7	Foral Millet	30 PLS	0.7	O	O	O	O	O	O	2-3" sandy soil
8	Pearl Millet	20 PLS	0.5	O	O	O	O	O	O	0.5 inches

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Application on slopes 3:1 or less.
4. Fifty pounds per acre of Annual Lespedeza may be added to 1/2 the seeding rate of any of the above species.
5. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
6. Warm season grasses such as fescue or Weeping Lovegrass may be used between 5/1 and 9/1 if desired. Seed 3-5 lbs. per acre. Good or low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 1 of 4

## Standard Detail & Specifications Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES									
Seeding Mixtures		Seeding Rate <sup>1</sup>	Optimum Seeding Dates <sup>1</sup>						Remarks
			<sup>1</sup> O - Optimum Period <sup>1</sup> A - Acceptable Period						
Mix No.	Certified Seed <sup>2</sup>	lb/ac <sup>1</sup>	4/1/00	5/1/00	6/1/00	7/1/00	8/1/00	9/1/00	
	<b>Well Drained Soils</b>								
1	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
2	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
3	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
4	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
5	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
6	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
7	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
8	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
9	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
10	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
11	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
12	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
13	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
14	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
15	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
16	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
17	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
18	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
19	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
20	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
21	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
22	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
23	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
24	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
25	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
26	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
27	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
28	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
29	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
30	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
31	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
32	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
33	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
34	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
35	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
36	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
37	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
38	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
39	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
40	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
41	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
42	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
43	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
44	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
45	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
46	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
47	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
48	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
49	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
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51	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
52	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
53	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
54	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
55	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
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57	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
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59	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
60	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
61	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
62	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
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67	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
68	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
69	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
70	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
71	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
72	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
73	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
74	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
75	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
76	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
77	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
78	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
79	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
80	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
81	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
82	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
83	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
84	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
85	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
86	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
87	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
88	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
89	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
90	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
91	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
92	Common Sunflower	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
93	Downy Woodpecker	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
94	Perennial Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
95	Annual Ryegrass	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
96	Winter Wheat	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
97	Foral Millet	30	0.89	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
98	Pearl Millet	20	0.5	A	O	A	O	A	Good erosion control rate. Tolerant of low fertility soils. Good wildlife cover and food.
99	Barley	125	4	O	A	O	A	O	Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.
100	Wing Bean	10	0.23						Good erosion control rate. Tolerant of low fertility soils. Long-term very difficult to mow. Seeding only for frost weather.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 2 of 4

## Standard Detail & Specifications Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)										
Mix No.	Certified Seed <sup>1</sup>	Seeding Rate <sup>1</sup>	Optimum Seeding Dates <sup>1</sup>						Remarks	
			Optimum Seeding Dates <sup>1</sup>							
Certified Seed		lb/ac <sup>1</sup>	4/1/00	5/1/00	6/1/00	7/1/00	8/1/00	9/1/00		
	<b>Pleaty Damanted Seals</b>									
8	Recher Pleaty Damanted Seals	125	4	O	A	O	A	O	10/1/00 Add 100 lb/ac of water type	Good stabilization of disturbed sites and waterways.
10	Recher Pleaty Damanted Seals	125	4	O	A	O	A	O		Good erosion control, reliable cover and permanent vegetation.
<b>Residential Lawns</b>										
11	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
12	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
13	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
14	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
15	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
16	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
17	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
18	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
19	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
20	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
21	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
22	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
23	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
24	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
25	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
26	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
27	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
28	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
29	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
30	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
31	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
32	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
33	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
34	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
35	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
36	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
37	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
38	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
39	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
40	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
41	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
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44	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
45	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
46	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
47	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
48	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
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98	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
99	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.
100	Full Force Perennial Ryegrass Pleaty Damanted Seals	125	3	O	A	O	A	O		High value, full maintenance, high traffic, requires necessary seeded soils, full sun.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 3 of 4

## Standard Detail & Specifications Vegetative Stabilization

### Construction Notes:

1. Site Preparation
  - a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
  - b. Final grading and shaping is not necessary for temporary seedings.
2. Seedbed Preparation
  - a. It is important to prepare a good seedbed to insure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
3. Soil Amendments
  - a. Lime - Apply liming materials based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
  - b. Fertilizer - Apply fertilizer based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soil.
4. Seeding
  - a. For **temporary stabilization**, select a mixture from **Sheet 1**. For a **permanent stabilization**, select a mixture from **Sheet 2** or **Sheet 3** depending on the conditions.
  - b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
  - c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
5. Mulching
  - a. All mulching shall be done in accordance with detail **DE-ESC-3.4.5**.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 4 of 4

## Standard Detail & Specifications Mulching

### 1. Materials and Amounts

- a. Straw - Straw shall be unrutted small grain straw applied at the rate of 1-1/2 to 2 tons per acre, or 70 to 90 pounds two bales per acre, for 1,000 square feet. These are particularly well suited for utility and road rights-of-way. If wood chips are used, increase the application rate of nitrogen fertilizer by 20 pounds of N per acre (200 pounds of 10-10-10 or 66 pounds of 30-3-0 per acre).
- b. Wood chips - Apply at the rate of approximately 6 tons per acre or 275 pounds per 1,000 square feet when available and when feasible. These are particularly well suited for utility and road rights-of-way. If wood chips are used, increase the application rate of nitrogen fertilizer by 20 pounds of N per acre (200 pounds of 10-10-10 or 66 pounds of 30-3-0 per acre).
- c. Hydraulically applied mulch - The following conditions apply to hydraulically applied mulch:
  - i. Definitions
    - a. Wood fiber mulch shall consist of specially prepared wood that has been processed to a uniform state, is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment, and consists of a minimum of 70% virgin or recycled wood fiber combined with 30% paper fiber and additives.
    - b. Blended fiber mulch shall consist of any hydraulic mulch that contains greater than 30% paper fiber. The paper component must consist of specially prepared paper that has been processed to a uniform fibrous state and is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment.
    - c. A bonded fiber matrix (BFM) consists of long strand, specially prepared wood fibers that have been processed to a uniform state held together by a water resistant bonding agent. BFM shall contain no paper (cellulose) mulch but may contain small percentages of synthetic fibers to enhance performance.
    - d. Refer to **Figure 3.4.5a** for conditions and limitations of use for each of the above categories of hydraulic mulch.
  - ii. All components of the hydraulically applied mulches shall be pre-packaged by the manufacturer to assure material performance. Field mixing of the mulch components is acceptable, but must be done per manufacturers recommendations to ensure the proper results.
  - iii. Hydraulic mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.
  - iv. Hydraulically applied mulches and additives shall be mixed according to manufacturers recommendations.
  - v. Materials within this category shall only be used when hydraulically applied mulch has been specified for use on the approved Sediment and Stormwater Plan, or supplemental approval from the plan approval agency has been obtained in writing for a specific area.

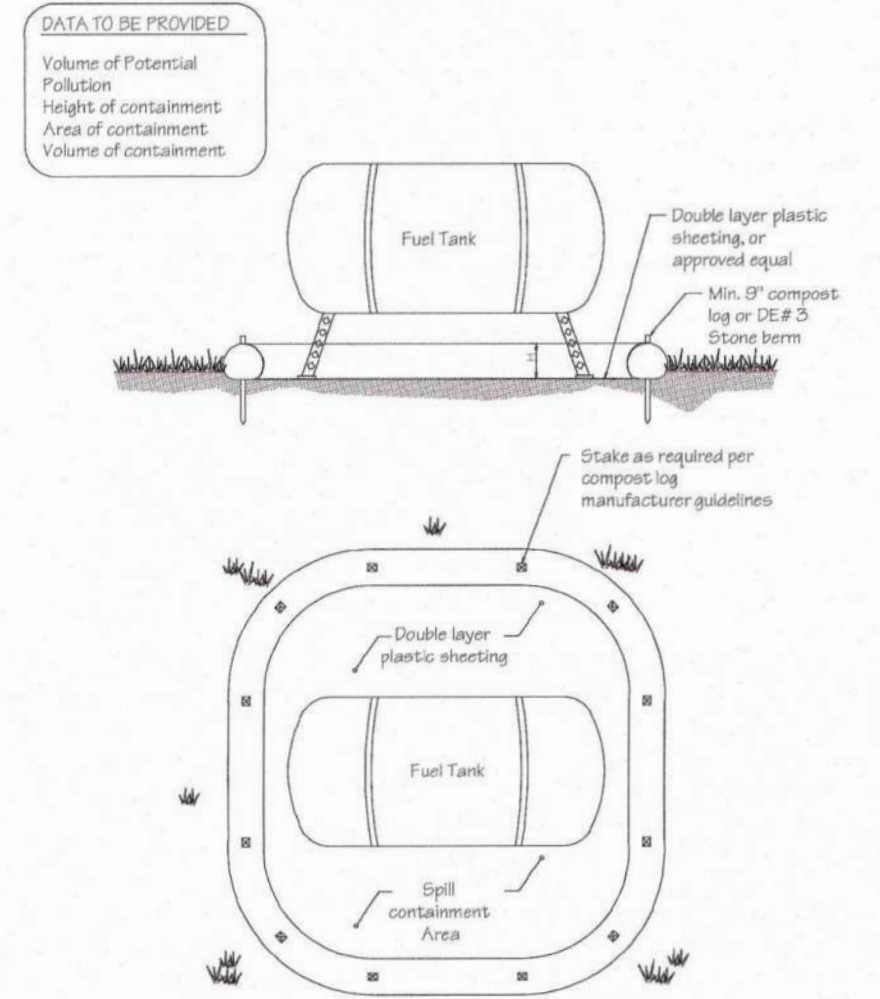
Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrac <sup>TM</sup> International		<b>DE-ESC-3.4.5</b> Sheet 1 of 3

## Standard Detail & Specifications Mulching

- a. Application
  - i. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope.
  - ii. Do not apply to saturated soils, or if precipitation is anticipated within 24-48 hours.
  - iii. During the spring (March 1 to May 31) and fall (September 1 to November 30) seasons, hydraulic mulches may be applied in a one-step process where all components are mixed together in single-tank loads. It is recommended that the product be applied from opposing directions to achieve optimum soil coverage.
  - iv. During the summer (June 1 to August 31) and winter (December 1 to February 28) seasons, the following two-step process is required:
    - i. Step One - Mix and apply seed and soil amendments with a small amount of mulch for visual metering.
    - ii. Step Two - Mix and apply mulch at manufacturer's recommended rates over freshly seeded surfaces. Apply from opposing directions to achieve optimum soil coverage.
  - v. Minimum curing temperature is 40°F (4°C). The best results and more rapid curing are achieved at temperatures exceeding 60°F (15°C). Curing times may be accelerated in high temperature, low humidity conditions on dry soils.
  - vi. Recommended application rates are for informational purposes only. Conformance with this standard and specification shall be performance-based and requires **100% soil coverage**. Any areas with bare soil showing shall be top dressed until full coverage is achieved.
- b. **Compost blanket (CB)** - Loosely applied with a pneumatic blower so that a compost blanket uniformly covers the soil with **100% coverage**. This application can be used with seed to promote germination by applying the approved seed mix directly into the loosely blown compost. The compost blanket performs best on slopes less than 2:1 and requires no mulch anchoring.
2. **Anchoring mulch** - Mulch must be anchored immediately to minimize loss by wind or water. This may be done by one of the following methods, depending upon size of area, erosion hazard, and cost:
  - a. **Crimping** - A crimper is a tractor drawn implement designed to punch and anchor mulch into the top two (2) inches of soil. This practice affords maximum erosion control but is limited to flatter slopes where equipment can operate safely. On sloping land, crimping should be done on the contour whenever possible.
  - b. **Tracking** - Tracking is the process of cutting mulch (usually straw) into the soil using a bulldozer or other equipment that runs on cleared tracks. Tracking is used primarily on slopes 3:1 or steeper and should be done up and down the slope with clear marks running across the slope.
  - c. **Liquid mulch binders** - Applications of liquid mulch binders should be heavier at toes, in valleys, and at crests of banks and other areas where the mulch will be moved by wind or water. All other areas should be applied uniformly. The use of synthetic binders is the preferred method of mulch binding and should be applied at the rates recommended by the manufacturer.
  - d. **Paper fiber** - The fiber binder shall be applied at a net dry weight of 750 lbs./ac. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons.
  - e. **Nettings** - Synthetic or organic nettings may be used to secure straw mulch. Install and secure according to the manufacturers recommendations.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrac <sup>TM</sup> International		<b>DE-ESC-3.4.5</b> Sheet 2 of 3

## Standard Detail & Specifications Construction Site Waste Mgt & Spill Control



Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.6.1</b> Sheet 1 of 5

## Standard Detail & Specifications Construction Site Waste Mgt & Spill Control

1. Fueling Prevention - Spill Prevention
  - a. Fueling should only take place in signed designated areas, away from downstream drainage facilities and watercourses.
  - b. Fueling must be with nozzles equipped with automatic shut-off to control drips. Do not top off.
  - c. Protect the areas where equipment or vehicles are being repaired, maintained, fueled or parked from storm water run-on and runoff.
  - d. Use barriers such as berms to prevent storm water run-on and runoff, and to contain spills.
  - e. Place a "Fueling Area" sign next to each fueling area.
  - f. Store hazardous materials such as fuel, solvents, oil and chemicals in secondary containment.
  - g. Inspect vehicles and equipment for leaks on each day of use. Repair fluid and oil leaks immediately.
  - h. Absorbent spill clean-up materials and spill kits must be available in fueling areas and on fuel trucks.
  - i. If fueling is to take place at night, make sure the fueling area is sufficiently illuminated.
  - j. Proper disposal of used oil, fluids, lubricants and spill clean-up materials.
2. **CLEAN UP SPILLS**
  - a. If it is safe to do so, immediately contain and clean up any chemical and/or hazardous material spills.
  - b. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.
  - c. Do not bury spills or wash them down with water.
3. **LEAKS AND DRIPS**
  - a. Use drip pans or absorbent pads at all times. Place under and around leaky equipment.
  - b. Do not allow oil, grease, fuel or chemicals to drip onto the ground.
  - c. Have spill kits and clean up material on-site.
  - d. Repair leaky equipment promptly or remove problem vehicles and equipment from the site. Clean up contaminated soil immediately.
  - e. Store contaminated waste in sealed containers constructed of suitable material. Label these containers properly.
  - f. Clean up all spills and leaks. Promptly dispose of waste and spent clean up materials.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.6.1</b> Sheet 2 of 5

## Standard Detail & Specifications Construction Site Waste Mgt & Spill Control

1. **Notes:**
  - a. The Construction Site Pollution Prevention Plan should include the following elements:
    - i. **Material Inventory**
      - a. Document the storage and use of the following materials:
        - i. Concrete
        - ii. Detergents
        - iii. Paints (enamel and latex)
        - iv. Cleaning solvents
        - v. Pesticides
        - vi. Wood scraps
        - vii. Fertilizers
        - viii. Petroleum based products
      - b. **Good housekeeping practices**
        - a. Store only enough product required to do the job.
        - b. All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
        - c. Substances shall not be mixed.
        - d. When possible, all of a product shall be used up prior to disposal of the container.
        - e. Manufacturers' instructions for disposal shall be strictly adhered to.
        - f. The site foreman shall designate someone to inspect all BMPs daily.
      - c. **Waste management practices**
        - a. All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
        - b. Waste materials shall be salvaged and/or recycled whenever possible.
        - c. The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		<b>DE-ESC-3.6.1</b> Sheet 3 of 5

## Standard Detail & Specifications Construction Site Waste Mgt & Spill Control

1. **Notes (cont.)**
  - a. Trash shall be disposed of in accordance with all applicable Delaware laws.
  - b. Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
  - c. If fertilizer bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.
2. **Equipment maintenance practices**
  - a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
  - b. If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
  - c. Drip pans shall be used for all equipment maintenance.
  - d. Equipment shall be inspected for leaks on a daily basis.
  - e. Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
  - f. Fuel nozzles shall be equipped with automatic shut-off valves.
  - g. All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.
3. **Spill prevention practices**
  - a. Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
  - b. Warning signs shall be posted in hazardous material storage areas.
  - c. Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
  - d. Low or non-toxic substances shall be prioritized for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		<b>DE-ESC-3.6.1</b> Sheet 4 of 5

## Standard Detail & Specifications Construction Site Waste Mgt & Spill Control

1. **Notes (cont.)**
  - a. Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.
2. **Education**
  - a. Best management practices for construction site pollution control shall be a part of regular progress meetings.
  - b. Information regarding waste management, equipment maintenance and spill prevention shall be prominently posted in the construction trailer.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		<b>DE-ESC-3.6.1</b> Sheet 5 of 5